

2013-1282, -1283, -1284, -1285

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**United States Court of Appeals  
for the Federal Circuit**

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INTERVAL LICENSING LLC,  
*Plaintiff-Appellant,*  
  
v.  
AOL, INC.,  
*Defendant-Appellee,*  
  
and  
APPLE, INC.,  
*Defendant-Appellee,*  
  
and  
GOOGLE, INC.,  
*Defendant-Appellee,*  
  
and  
YAHOO! INC.,  
*Defendant-Appellee.*

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*Appeal from the United States District Court for the Western District of  
Washington in consolidated case nos. 13-CV-0263, 13-CV-0264,  
13-CV-0265, and 13-CV-0266, Judge Marsha J. Pechman.*

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June 27, 2013

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# CERTIFICATE OF INTEREST

Counsel for Interval Licensing LLC certifies the following:

- I. The full name of every party or *amicus* represented by us is:

Interval Licensing LLC

- II. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by us is:

None

- III. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party represented by us are:

None

- IV. The names of all law firms and the partners or associates who appeared for the party now represented by us in the trial court or are expected to appear in this Court are:

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Dated: June 27, 2013

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## STATEMENT OF RELATED CASES

Four appeals were consolidated into the present appeal: *Interval Licensing LLC v. AOL, Inc.* (No. 13-1282), *Interval Licensing LLC v. Apple, Inc.* (No. 13-1283), *Interval Licensing LLC v. Google, Inc.* (No. 13-1284), and *Interval Licensing LLC v. Yahoo! Inc.* (No. 13-1285). There have been no other appeals in or from the same proceedings at the District Court.

Due to a complicated procedural history (including severance, consolidation, stay pending reexamination, and a partial lifting of that stay), there are four cases pending at the Western District of Washington that may be nominally affected by the outcome of this appeal. The lengthy chronology that follows fully explains the related cases.

This litigation began on August 27, 2010, when Interval Licensing LLC (“Interval”) filed one case in the Western District of Washington (Case No. 2:10-cv-1385) in which it asserted four patents—U.S. Patent Nos. 6,034,652 and 6,788,314 (which are at issue in this appeal) and the unrelated U.S. Patent Nos. 6,263,507 and 6,757,682 (which are not). The complaint named as defendants, *inter alios*, the four Defendant-Appellees here: AOL, Inc., Apple, Inc., Google, Inc., and Yahoo! Inc. (collectively, “Defendant-Appellees” or “Defendants”).

The District Court (Pechman, J.) divided the original case into two “tracks”: a first track consisting of Interval’s claims for infringement of the ’652 and ’314

patents against Defendant-Appellees (at issue in this appeal), and a second track containing Interval's claims for infringement of the '507 and '682 patents against Defendant-Appellees as well as seven other defendants (not at issue in this appeal). *See* Case No. 2:10-cv-1385-MJP, Dkt. No. 178 (W.D. Wash. Feb. 16, 2011).

The District Court then reorganized the case by defendant. It severed the original case into separate docket numbers for each defendant (including both tracks). The cases against Defendants-Appellees are: AOL, Inc. (Lead Case, No. 2:10-cv-1385), Apple, Inc. (Case No. 2:11-cv-708), Google, Inc. (Case No. 2:11-cv-711), and Yahoo! Inc. (Case No. 2:11-cv-716). The Court then consolidated the cases pursuant to Federal Rule of Civil Procedure 42(a). *See* Case No. 2:10-cv-1385-MJP, Dkt. No. 229 (W.D. Wash. Apr. 29, 2011).

Early in the litigation, reexamination requests were filed and granted at the United States Patent & Trademark Office (“USPTO”) for each of the four asserted patents. The District Court stayed the four cases pending the outcome of the reexaminations. *See* Case No. 2:10-cv-1385-MJP, Dkt. No. 253 (W.D. Wash. June 16, 2011). After the examiner confirmed the patentability of the asserted claims in the reexaminations of the ’652 (*ex parte*) and ’314 patents (*inter partes*, currently on appeal to the Board), the District Court lifted the stay with respect to

the track containing Interval's claims for infringement of those two patents. *See* Case No. 2:10-cv-1385-MJP, Dkt. No. 269 (W.D. Wash. June 25, 2012).<sup>1</sup>

That track then proceeded to claim construction in the consolidated cases against Defendant-Appellees. On December 28, 2012, the District Court issued the Claim Construction Order that addressed the issues presented in this appeal. *See* Case No. 2:10-cv-1385-MJP, Dkt. No. 341 (W.D. Wash. Dec. 28, 2012) (A1-31). As explained in detail below, this Order held that certain claim terms were indefinite and adopted a construction that led to a stipulation of no infringement of the remaining asserted claims.

Because the cases at the District Court at the time of the Claim Construction Order formally included both Interval's claims for infringement of the '652 and '314 patents (at issue in this appeal) as well as Interval's claims for infringement of the '507 and '682 patents (still stayed pending reexamination and not at issue in this appeal), the District Court severed all of the claims and counterclaims relating to the '652 and '314 patents into four new cases: Nos. 2:13-cv-263 (v. AOL, Inc.), 2:13-cv-264 (v. Apple, Inc.), 2:13-cv-265 (v. Google, Inc.), and 2:13-cv-266 (v. Yahoo! Inc.). *See* Case No. 2:10-cv-1385-MJP, Dkt. No. 345 (W.D. Wash. Feb.

<sup>1</sup> Litigation on the other two patents—the '507 and '682 patents—remains stayed. The *ex parte* reexamination of the '507 patent is still pending in front of the examiner. The *inter partes* reexamination of the '682 patent is currently on appeal to the Board.

12, 2013). For each severed case, the District Court issued a Final Judgment Order that: (1) granted final judgment of invalidity of certain claims of the '652 and '314 patents based on the Claim Construction Order; (2) granted final judgment of non-infringement for the remaining asserted claims of the '652 patent based on the Claim Construction Order and a stipulation among the parties; and (3) dismissed all counterclaims without prejudice. *See* Dkt. No. 7 in Case Nos. 2:13-cv-263, -264, -265, -266 (W.D. Wash. Feb. 28, 2013) (A188-89, A221-22, A254-55, A287-88). These four Final Judgment Orders are the basis of the present appeal.

## **JURISDICTIONAL STATEMENT**

The District Court had jurisdiction under 28 U.S.C. § 1338(a). This Court has jurisdiction under 28 U.S.C. § 1295(a)(1). As explained in the preceding Statement of Related Cases, the District Court entered a Final Judgment Order in each of the cases underlying this consolidated appeal on February 28, 2013. Interval filed timely notices of appeal in each on March 26, 2013.

## STATEMENT OF THE ISSUES

- (1) Whether the District Court erred in holding that the claim term “in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus” is indefinite.
- (2) Whether the District Court erred in holding that the claim term “means for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus” is indefinite because of an alleged lack of corresponding structure disclosed in the specification.
- (3) Whether the District Court erred in construing the claim term “attention manager” as limited to two specific embodiments.
- (4) Whether the District Court erred by adopting a construction of “instructions” from a dictionary that is inconsistent with the intrinsic record.

## STATEMENT OF THE CASE

On August 27, 2010, Interval filed suit against Defendants alleging in relevant part infringement of the '652 and '314 patents.<sup>2</sup>

In early 2011, Google and Yahoo! filed a request for *ex parte* reexamination of the '652 patent at the USPTO. Apple filed a request for *inter partes* reexamination of the '314 patent. After the USPTO granted both reexamination requests, the District Court stayed the litigation. *See* Case No. 2:10-cv-1385-MJP, Dkt. No. 253 (W.D. Wash. June 16, 2011).

On October 14, 2011, the USPTO examiner issued an Action Closing Prosecution in the *inter partes* reexamination of the '314 patent confirming the patentability of each of the asserted claims. (Apple's appeal to the Board of Patent Appeals and Interferences is pending.) On June 5, 2012, the examiner issued an *Ex Parte* Reexamination Certificate confirming the patentability of each of the asserted claims of the '652 patent. The examiner also allowed new claims that incorporated the terms the District Court later ruled indefinite.

The District Court then lifted the stay. *See* Case No. 2:10-cv-1385-MJP, Dkt. No. 269 (W.D. Wash. June 25, 2012). The case proceeded to claim construction. On December 28, 2012, the District Court issued a Claim

<sup>2</sup> As discussed above, Interval’s complaint included additional defendants and claims related to additional patents. Because those matters are now severed into separate cases that are not on appeal, Interval will not discuss them further.

Construction Order holding, *inter alia*, that (1) the claim term “in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus” is indefinite; (2) a means-plus-function limitation containing the claim term “in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus” is indefinite due to the lack of a sufficient description of corresponding structure in the specification; (3) the claim term “attention manager” was limited to only two specific embodiments mentioned in the specification; and (4) the claim term “instructions” was to be given a particular dictionary definition selected by Defendants. *See* A1-31.

Based on the Claim Construction Order, the parties stipulated that claims 4-8, 11, 34, and 35 of the '652 patent and claims 1-4 and 7-15 of the '314 patent were invalid as indefinite, and that claims 15-18 of the '652 patent were not infringed by any Defendant. On February 28, 2013, the District Court issued a Final Judgment Order to this effect in each of the cases on appeal. A188-89, A221-22, A254-55, A287-88.



## INTRODUCTION

Interval alleges that Defendants infringe its patents on an “attention manager.” This appeal primarily addresses one aspect of the invention—the manner in which the information is displayed to the user. Specifically, the invention seeks to present information in ways that do not interfere with the user’s other uses of an electronic device, such as a computer or smartphone. The invention provides an easy way for users to receive and take advantage of information that they might otherwise not seek out or that might otherwise unnecessarily distract them.

According to the invention, information may be displayed in either of two ways: at *times* when the user is not actively using the device; or in *areas* of the display screen that are not used by what the user is actively doing. According to the specification, the latter type of display occurs “in an unobtrusive manner that does not distract the user from the primary interaction with the apparatus.”

During claim construction, the District Court addressed three claim terms relating to the type of display. The District Court held two terms indefinite for using the language “in an unobtrusive manner that does not distract a user” and cabined a third term (“attention manager”) to two specific embodiments even though the specification expressly contemplates other implementations. These constructions led to the stipulated final judgment of non-infringement or invalidity

of all asserted claims. Interval respectfully requests that this Court correct these errors.

If a remand is ordered, Interval also requests that the Court review the District Court's construction of a fourth term ("instructions") which appears in many of the asserted claims. The District Court adopted a dictionary definition proposed by Defendants that invites arguments that cannot be reconciled with the intrinsic record.

## STATEMENT OF THE FACTS

### A. Interval Research Corporation & Interval Licensing LLC

The patented technology at issue in this appeal was developed at Interval Research Corporation (“Interval Research”), a privately funded think tank founded in 1992 by Paul Allen and David Liddle to perform advanced research and development in the areas of information systems, communications, and computer science. Mr. Allen, who served as Interval Research’s chairman, is the co-founder of Microsoft Corp. and one of the earliest pioneers of personal computer software. Mr. Liddle, who served as Interval Research’s president and chief executive officer, is a veteran of Xerox’s innovative Palo Alto Research Center. Messrs. Allen and Liddle worked together to build Interval Research into a preeminent technology firm that employed over 110 of the world’s leading scientists, physicists, and engineers.

Interval Research sought to be at the forefront of designing innovative, next-generation technology. It was successful in this regard, pioneering a large number of groundbreaking technologies and—after only one decade in existence—earning three hundred issued patents or pending applications. A1674.

In addition to developing its own technologies, Interval Research provided funding and assistance for other projects. For instance, Interval Research served as an outside collaborator to and provided research funding for Sergey Brin and

Lawrence Page’s research that resulted in the formation of Google. A1691; A1703.

Despite its accomplishments, Interval Research did not succeed commercially. In 2000, Interval Research laid off the bulk of its staff and, in 2004, it dissolved. A1674.

Interval Research transferred ownership of the two patents at issue in this appeal to Interval Licensing LLC, the Plaintiff-Appellant in this case. Interval Licensing is a sister company to Vulcan Inc., which is the corporation that was founded by Mr. Allen to manage his business and charitable endeavors. A1673-74. Vulcan Inc. and Interval Licensing have sought to protect, enforce, and monetize Interval Research’s patent rights by selling, licensing, or litigating the patents in its portfolio.

## **B. The Asserted Patents**

Interval Research developed the inventions of the Asserted Patents—U.S. Patent Nos. 6,034,652 (“the ’652 patent”) and 6,788,314 (“the ’314 patent”) (collectively, the “Asserted Patents”)—in the mid-1990s. A principal focus of the company at that time was to develop technology that would assist users in accessing and managing the massive amount of information newly available because of the rapid development of the Internet.

The Asserted Patents, which have a common specification, describe an “attention manager.” The patents use the name “attention manager” to describe a system that obtains, schedules, and displays information to a user in one or more ways that do not interfere with the user’s other activities on the computer. *See* ’652 Patent, Abstract (A32).

The attention manager enables the user to identify information of interest, which can then be automatically obtained and updated. *E.g., id.* at 16:1-16 (A48), 18:60-19:21 (A49-50). The invention also facilitates flexible control over the scheduling of the display of the information. For example, embodiments of the invention may permit the users and/or content providers to decide whether, when, and for how long information will be displayed. *E.g., id.* at 10:43-11:33 (A45-46); 16:65-17:28 (A48-49). These scheduling capabilities are important because the invention enables the acquisition and display of information from multiple unrelated sources, which must be coordinated to present a useful display. *Id.*

The specification also describes numerous other features that can further improve functionality and usefulness. *E.g., id.* at 25:4-28:28 (A53-54). For example, the attention manager can enable the user to navigate through the display of available information and click on a particular image to link to more detailed or related materials. *Id.* at 25:46-60, 27:16-48 (A53-54). Additionally, certain

embodiments permit auditing of the attention manager so that users, content providers, or third parties can obtain usage statistics. *Id.* at 28:29-29:27 (A54-55).

The manner in which the attention manager displays information to the user is central to this appeal. The patents use the term “peripheral attention” to describe the portion of the user’s attention that is sought to be engaged by the attention manager so as to display information without interfering with the user’s other uses of the device. *E.g., id.*, at Abstract (A32). The specification describes two general ways in which an attention manager can engage the user’s peripheral attention.

*First*, the attention manager can display information at times when the user is not actively using the computer. *Id.* at 2:8-12 (A41). The specification refers to this embodiment as displaying information in the display device’s unused “temporal dimension”—*i.e.*, at times when the computer is not being used for other purposes. *Id.* at 6:34-38, 45-51 (A43). The specification further states that this embodiment displays information during “inactive periods.” *Id.* at 2:8-12 (“For example, the information can be presented to the person while the apparatus (e.g., computer) is operating, but during *inactive periods* (i.e., when a user is not engaged in an intensive interaction with the apparatus).” (emphasis added)) (A41). Because the nature of the display according to this embodiment is similar to a screen saver that runs after a period of time when the computer is idle, the

specification also describes this embodiment as the “screen saver embodiment.”

*Id.* at 3:19-22 (A42).

*Second*, the specification teaches that an attention manager can also be implemented to engage a user’s peripheral attention by displaying information “during active periods” of use, but “in an unobtrusive manner that does not distract the user from the primary interaction with the apparatus.” *Id.* at 2:12-19 (A41). The specification describes this embodiment as displaying information in the display device’s unused “spatial dimension.” *Id.* at 6:38-51 (A43).

As the phrase “spatial dimension” suggests, in this embodiment, the information is presented in areas of the display screen that do not interfere with the user’s primary interaction with the computer. *Id.* at 2:17-19 (“e.g., the information is presented in areas of a display screen that are not used by displayed information associated with the primary interaction.”) (A41); *id.* at 3:25-31 (“According to another further aspect of the invention, the selective display of an image or images occurs while the user is engaged in a primary interaction with the apparatus, which primary interaction can result in the display of an image or images in addition to the image or images generated from the set of content data . . . .”) (A42).

Presumably because this type of display is loosely related to traditional computer “wallpapers,” which display images on the background of a computer that may be partially covered by one or more windows containing the user’s primary activity,

the specification also refers to this embodiment as the “wallpaper embodiment.”

*Id.* at 3:25-31 (A42). It is critical to note, however, that the definition of the “wallpaper embodiment” provided by the specification is not using the word “wallpaper” as synonymous with the background of a computer screen, as is made clear by the broader language that precedes it. *Id.* (A42).

Of particular relevance, only this second embodiment—the one relating to the device’s unused spatial dimension—is described as displaying information “in an unobtrusive manner that does not distract the user from the primary interaction with the apparatus.” *Id.* at 2:12-19 (A41).

The following table summarizes the two embodiments described in the specification:

| <b>ATTENTION MANAGER</b>   |   |
|--|---|
| <p>“Screen Saver Embodiment”</p> <ul style="list-style-type: none"> <li>• Uses the unused <i>temporal</i> capacity of the display device</li> <li>• Displays information during <i>inactive</i> periods</li> </ul> | <p>“Wallpaper Embodiment”</p> <ul style="list-style-type: none"> <li>• Uses the unused <i>spatial</i> capacity of the display device</li> <li>• Displays information during <i>active</i> periods</li> <li>• Displays “in an unobtrusive manner that does not distract a user”</li> </ul> |

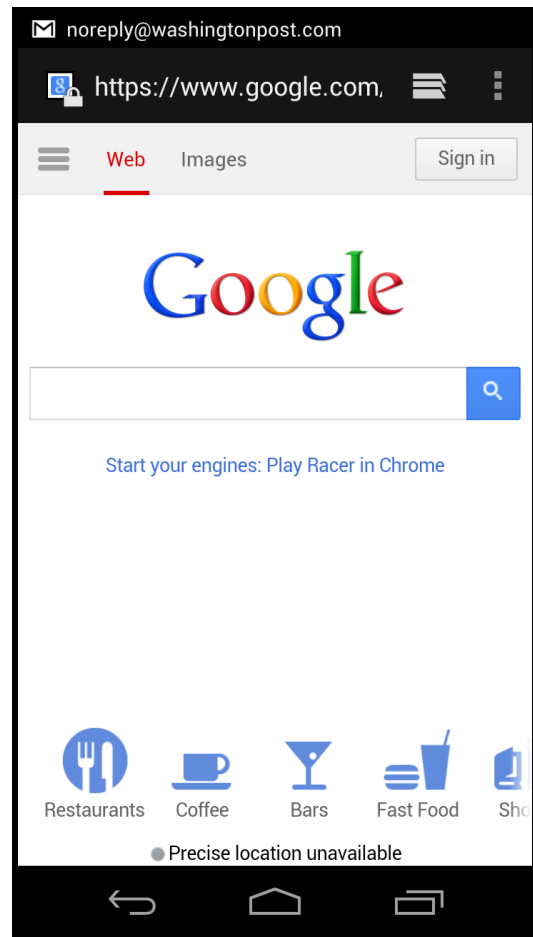


In sum, an attention manager provides a new avenue for users to easily obtain and view information that they might not otherwise expend the effort to acquire. This helps users take advantage of the vast universe of available information and benefits content providers by providing an additional avenue for their information to reach the eyes of consumers. *Id.* at 1:11-67 (A41).

### C. The Infringing Products

Although not necessary for deciding the issues on the appeal, a brief description of the products accused of infringing the Asserted Patents may provide useful context. *See Wilson Sporting Goods Co. v. Hillerich & Bradsby Co.*, 442 F.3d 1322, 1326-27 (Fed. Cir. 2006) (noting that “knowledge of [the accused product] provides meaningful context for . . . claim construction”).

Interval alleges that Defendants’ accused products are infringing claims directed to the unused spatial dimension (or “wallpaper”) embodiment disclosed in the patents. Specifically, Defendants sell and/or distribute products and software that include functionality for acquiring and presenting information to the user in “pop-up” notifications in peripheral areas of the screen so as to avoid interfering with the user’s on-going activities. For example, the following screenshots demonstrate how an Apple iPod Touch (left) and Google Galaxy Nexus (right) provide unobtrusive notifications at the top of the display screen when a user receives a new email:



These and the other accused devices practice the inventions claimed in the Asserted Patents by obtaining data and coordinating the unobtrusive display of these types of notifications for emails and other events such as text messages, voicemails, calendar reminders, and social network status updates.

#### **D. The District Court's Claim Construction Order**

Relevant to this appeal, the District Court's Claim Construction Order construed three terms that relate to the claimed information display:

| <b>Claim Language</b>  | <b>Relevant Claims</b>  |
|--|---|
| “in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus”  | ’652 Patent: 4-8, 11, 34, 35<br>’314 Patent: 1-4, 7-15        |
| “means for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data” | ’652 Patent: 4-8, 11, 34, 35<br>’314 Patent: 7-9 <sup>3</sup> |
| “during operation of an attention manager”   | ’652 Patent: 15-18  |

The District Court held that the first two terms are indefinite because, in the Court’s view, their scope depends on what specific individual users subjectively find “unobtrusive” or “distracting.” A6-10. The District Court construed the third term as limited to either a screen saver or a display “as a background of the computer screen.” A18.

Addressing the “unobtrusive manner” language, the District Court concluded that “[t]he intrinsic record provides no basis for a person of ordinary skill in the art to determine whether a displayed image is displayed in an ‘unobtrusive manner’” and “[t]he Patents’ specification . . . fails to provide guidance.” A6-7. On that basis, the District Court interpreted the claim language as encompassing any display that any user might subjectively deem unobtrusive. The District Court

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<sup>3</sup> The parties stipulated that the “display apparatus” recited in claim 7 of the ’314 patent was written in means-plus-function form and should be construed the same as the “means for selectively displaying.” A887.

opined that “the same image may or may not be considered unobtrusive depending on a variety of factors, such as color, size, and information displayed.” A6-7. It also questioned what “colors,” “shapes” or “areas of the display screen” might be considered subjectively unobtrusive by particular users. A12. The District Court further suggested it would be necessary to consider the personal characteristics of individual users, such as their “ability to focus” and “ability to concentrate.” A7.

The District Court additionally held that a means-plus-function limitation containing the same “unobtrusive manner that does not distract a user” language was indefinite for two reasons. *First*, echoing the Court’s conclusion above, it “includes a phrase that is indefinite within the recited function; therefore this term is indefinite.” A15. *Second*, given the many ways in which a display might or might not be “unobtrusive,” the specification “fails to identify any algorithm that is actually capable of accomplishing the function.” A16.

In an attempt to give claims containing the term “attention manager” “meaningful boundaries,” the District Court construed that term as limited to two very specific embodiments: “a system that displays images to a user either when the program detects that the user is not engaged in a primary interaction or as a background of the computer screen.” A18-19.

The District Court also construed the term “instructions” to mean “a statement in a programming language that specifies a function to be performed by

a system.” A27. This construction, which was proposed by Defendants, is based on a definition in the IEEE Standard Dictionary of Electrical and Electronics Terms.

## SUMMARY OF THE ARGUMENT

The District Court's Claim Construction Order contains four legal errors.

*First*, the District Court erred by holding that the term “in an unobtrusive manner that does not distract a user” is indefinite. This Court's precedent strongly disfavors a finding of indefiniteness. Even if claim language may be viewed as subjective, it is indefinite only if the specification fails to provide any objective guidance as to its meaning. In this case, the specification establishes that the contemplated display is one that occurs in an area of the display screen that is not substantially used by the user's primary use of the device. This teaching is easily sufficient to satisfy the requirements of 35 U.S.C. § 112, ¶ 2.

*Second*, the District Court incorrectly held that a means-plus-function limitation containing the phrase “in an unobtrusive manner that does not distract a user” was indefinite for failure to disclose the corresponding structure in the specification. Once one recognizes the correct meaning of the term “in an unobtrusive manner that does not distract a user,” the algorithm described in the specification for performing the recited function provides sufficient structure to alleviate any concerns about pure functional claiming.

*Third*, the District Court construed the term “attention manager,” which is the genus term used in the patents to describe either of the two embodiments, as

encompassing only two narrow examples in the specification and excluding other implementations that are expressly described.

*Fourth*, the District Court adopted a dictionary definition of the term “instructions” (selected and proposed by Defendants) that—as is often the case with extrinsic evidence—does not square with how the term is used in the Asserted Patents. As a result, absent guidance from this Court, there is a significant danger that Defendants will apply it on remand in a manner that is inconsistent with the intrinsic record, thereby requiring a future appeal.

## ARGUMENT

### I. Standards of Review

“[C]laim construction, as a purely legal issue, is subject to de novo review on appeal.” *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1451 (Fed. Cir. 1998) (en banc). This includes “exercis[ing] *de novo* review over the conclusion that a claim is indefinite under 35 U.S.C. § 112, P2.” *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005). “A district court’s identification of the function and corresponding structure of a means-plus-function limitation is also reviewed de novo.” *JVW Enters. v. Interact Accessories, Inc.*, 424 F.3d 1324, 1329 (Fed. Cir. 2005).

### II. Within The Context Of The Specification, The Claim Term “In An Unobtrusive Manner That Does Not Distract A User Of The Apparatus From a Primary Interaction With The Apparatus” Is Not Indefinite

This case calls for the straightforward application of the principle that a claim term is indefinite only if the accused party “demonstrate[s] by clear and convincing evidence that one of ordinary skill in the relevant art could not discern the boundaries of the claim based on the claim language, the specification, the prosecution history, and the knowledge in the relevant art.” *Haemonetics Corp. v. Baxter Healthcare Corp.*, 607 F.3d 776, 783 (Fed. Cir. 2010). A ruling by this Court affirming the District Court would cast this Court’s previously uniform and clear precedent into disarray. The result would be to sow confusion among district



courts with respect to varied patent claims and to invite irreconcilable determinations of invalidity on similar facts.

The critical question when evaluating an indefiniteness challenge is “whether a person experienced in the field of the invention would understand the scope of the claim when read in light of the specification.” *Energizer Holdings v. ITC*, 435 F.3d 1366, 1369 (Fed. Cir. 2006); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 (Fed. Cir. 2005) (en banc) (“[T]he specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.” (quotation marks omitted)).

A claim is invalid only if it “is insolubly ambiguous, and no narrowing construction can properly be adopted.” *Exxon Res. & Eng’g Co. v. U.S.*, 265 F.3d 1371, 1375 (Fed. Cir. 2001). “[T]he definiteness of claim terms depends on whether those terms can be given *any reasonable meaning*.” *Hearing Components, Inc. v. Shure Inc.*, 600 F.3d 1357, 1366 (Fed. Cir. 2010) (emphasis added). “Claims using relative terms . . . are insolubly ambiguous only if they provide *no guidance* to those skilled in the art as to the scope of that requirement.” *Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010) (emphasis added).

This long-standing approach to evaluating indefiniteness challenges recognizes that skilled patent litigators excel at finding (or creating) ambiguity and,

as a result, avoids “a broad concept of indefiniteness, [where] all but the clearest claim construction issues could be regarded as giving rise to invalidating indefiniteness in the claims at issue.” *Exxon*, 265 F.3d at 1375; *see also Haemonetics*, 607 F.3d at 783 (“[B]ecause claim construction frequently poses difficult questions over which reasonable minds may disagree, proof of indefiniteness must meet ‘an exacting standard.’”). By finding indefiniteness only where the Court cannot arrive at a reasonable construction, this Court “accord[s] respect to the statutory presumption of patent validity, and . . . protect[s] the inventive contribution of patentees, even when the drafting of their patents has been less than ideal.” *Exxon*, 265 F.3d at 1375.

As in the many cases in which this Court has rejected indefiniteness challenges to relative terms, the specification in the Asserted Patents provides the public with sufficient notice of the claim term’s meaning. A display in an “unobtrusive manner that does not distract a user” is one positioned in an area of the display screen not substantially used by the user’s primary activity. This guidance provides a sufficiently objective standard to one skilled in the art to comply with 35 U.S.C. § 112, ¶ 2. *See* ‘652 Patent, at 2:12-19 (A41); 3:25-31 (A42); 6:38-51 (A43); *see also Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 624 (Fed. Cir. 1985) (“If the claims, read in the light of the specifications, reasonably apprise those skilled in the art both of the utilization and

scope of the invention, and if the language is as precise as the subject matter permits, the courts can demand no more.”) (quoting *Georgia-Pacific Corp. v. United States Plywood Corp.*, 258 F.2d 124, 136 (2d Cir. 1958)).

*A. The Specification Provides A Reasonably Precise and Objective Definition of What It Means to Display Information “In An Unobtrusive Manner That Does Not Distract a User”*

The District Court’s decision cannot be reconciled with this Court’s precedents. The specification and claims of the Asserted Patents describe two embodiments that can display information without interfering with the user’s primary activity on the computer. This appeal involves the “wallpaper embodiment,” in which information is displayed “in an unobtrusive manner that does not distract a user.” *Supra*, pp. 10-14. The specification demonstrates that displaying information “in an unobtrusive manner that does not distract a user” means displaying the information in an area of the display screen that is not substantially used by the user’s primary activity. Because the District Court failed to appreciate that the language describing display “in an unobtrusive manner that does not distract a user” is tied to a specific type of display described in the specification, it improperly divorced its analysis from the context of the written description and incorrectly focused on irrelevant hypotheticals such as vibrant color choices and users with unusually short attention spans. This Court accordingly should reverse the District Court’s judgment of invalidity.

- i. *The Specification Informs The Skilled Artisan What It Means to Display “In An Unobtrusive Manner That Does Not Distract a User”*

This is not the highly unusual case in which a claim term is invalid as insolubly ambiguous. The specification provides context that reasonably apprises those skilled in the art regarding the meaning of displaying “in an unobtrusive manner that does not distract a user.” The “unobtrusive manner” language describes a particular embodiment (not merely any display that users subjectively find “unobtrusive”). That embodiment displays information during a user’s use of the device but in an area of the display screen that does not interfere with the user’s other activities.

To begin with, the Summary of the Invention explains:

An attention manager according to the invention presents information to a person in the vicinity of a display device in a manner that engages the peripheral attention of the person. . . . For example, the information can be presented to the person while the apparatus (e.g., computer) is operating, but during inactive periods (i.e., when a user is not engaged in an intensive interaction with the apparatus). *Or, the information can be presented to the person during active periods (i.e., when a user is engaged in an intensive interaction with the apparatus), but in an unobtrusive manner that does not distract the user from the primary interaction with the apparatus (e.g., the information is presented in areas of a display screen that are not used by displayed information associated with the primary interaction with the apparatus).*

‘652 Patent, at 2:3-19 (emphases added) (A41). This passage provides two important points of guidance to those of skill in the art.

*First*, the language referring to an “unobtrusive manner that does not distract the user” is used only to describe the second of the two embodiments (*i.e.*, it does not describe the “screen saver embodiment,” which is referenced in the preceding sentence). Accordingly, even if a display akin to a screen saver might be considered to be “unobtrusive” or “non-distracting” by some people in other contexts, one of skill in the art would not consider it as such in the context of this invention. The patent ties the “unobtrusive manner that does not distract a user” language to only the “wallpaper embodiment.”

*Second*, according to the specification, displaying information “in areas of a display screen that are not used by displayed information associated with the primary interaction with the apparatus” *is* a form of a display that functions “in an unobtrusive manner that does not distract the user from the primary interaction with the apparatus.” *Id.*

In a later paragraph, the specification provides additional guidance when contrasting the two types of displays contemplated by the invention:

In one embodiment of the invention, the information is presented by the attention manager while a primary interaction is ongoing, but during inactive periods (*i.e.*, when the user is not engaged in an intensive interaction with the apparatus). *In another embodiment of the invention, the information is presented by the attention manager during active periods (i.e., when the user is engaged in an intensive interaction with the apparatus), but in an unobtrusive manner that does not distract the user from the primary interaction (e.g., the information is presented in areas of a display screen that are not used by displayed information associated with the primary interaction).*

Generally, then, an attention manager according to the invention makes use of “unused capacity” of a display device, “unused capacity” being defined broadly to include, for example, the embodiments mentioned above, i.e., both temporal (e.g., the first-described embodiment above) *and spatial (e.g., the second-described embodiment above) dimensions*.

‘652 Patent, at 6:34-51 (emphases added) (A43). This paragraph reiterates and reinforces the two points identified above. It also makes a third point: A display occurs “in an unobtrusive manner that does not distract the user from the primary interaction” if it “makes use of ‘unused capacity of a display device’” in the “spatial dimension”—in other words, it uses areas of the display device that are not used by the user’s primary application (e.g., a word processing program or video game). *Id.*, at 6:38-51, 6:23-32 (A43).

*Third*, the specification introduces the “screen saver embodiment” and “wallpaper embodiment” terminology in another paragraph of the Summary of the Invention that further emphasizes the dichotomy between the embodiments. As discussed, only the latter occurs “in an unobtrusive manner that does not distract a user”:

According to a further aspect of the invention, the selective display of the image or images begins automatically after detection of an idle period of predetermined duration (the “screen saver embodiment”). This aspect can be implemented, for example, using the screen saver API (application program interface) that is part of many operating systems. *According to another further aspect of the invention, the selective display of an image or images occurs while the user is engaged in a primary interaction with the apparatus, which primary interaction can result in the display of an image or images in addition*

*to the image or images generated from the set of content data (the “wallpaper embodiment”).*

‘652 Patent at 3:18-31 (emphasis added). By specifying that the display of the “wallpaper embodiment” occurs “in addition to” the display of images relating to the user’s primary interaction, this paragraph emphasizes that a “display in an unobtrusive manner that does not distract a user” within the context of the invention is one that occurs in an area of the display screen that is not substantially used by the user’s primary activity.

*ii. Interval’s Proposed Construction Is Consistent With The Specification*

Interval’s proposed construction, which specifies that a display “in an unobtrusive manner that does not distract a user” occurs “during a user’s primary interaction with the apparatus and the information is presented in an area of the display screen not substantially used by displayed information associated with the primary interaction of the user,” accurately captures the meaning provided by the specification and that would be understood by those of skill in the art.<sup>4</sup>

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<sup>4</sup> Interval’s originally proposed construction for this term was “during a user’s primary interaction with the apparatus and unobtrusively such that the images generated from the set of content data are displayed in addition to the display of images resulting from the user’s primary interaction.” Defendants took issue with Interval using the word “unobtrusively” in its proposed construction, arguing that it was no more helpful than the original claim language. A398, ll.19-21. To resolve this criticism, Interval modified its proposed construction to what is set forth above, which captures the same concept but without using the word “unobtrusively.”

*First*, Interval’s construction correctly reflects that the asserted patents give a distinct meaning to the phrase “in an unobtrusive manner that does not distract a user.”<sup>5</sup> This language refers to a type of display that uses the otherwise unused areas of the screen so as to not interfere with an ongoing application. This term does not, as the District Court erroneously concluded, encompass any and all aspects of a display that a particular user might find unobtrusive or non-distracting. *See* A6, ll. 13-15 (incorrectly stating that “[t]he intrinsic record provides no basis for a person of ordinary skill in the art to determine whether a displayed image is displayed in an ‘unobtrusive manner.’”).

*Second*, that phrase is properly understood to permit insubstantial overlap in portions of the screen used by the user’s primary interaction. This is consistent with the specification, which uses exemplary language (“e.g.”) when referencing an embodiment that displays without any overlap. ’652 Patent, at 2:15-19 (A41); 6:43-45 (A43). In one embodiment, the specification describes the attention manager’s display as occurring “in addition” to the primary interaction, which does

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<sup>5</sup> The District Court appears to have treated the term “in an unobtrusive manner that does not distract a user” as having two separate requirements: (1) the use of an “unobtrusive manner”; and (2) that it actually “does not distract a user.” A6-7. Because the phrase is used as a whole repeatedly throughout the specification and claims—*i.e.*, references to “an unobtrusive manner” are immediately followed by the language “that does not distract”—all of the words of the phrase should be construed together.



not foreclose some nominal overlap. *Id.* at 3:25-31 (A42).<sup>6</sup> And the specification contemplates that the display may take the place of “extraneous information.” *Id.* at 7:45-48 (A44).

The District Court’s contrary view lacks support, and if this Court were to affirm it would create a significant inconsistency in its precedent. The District Court reasoned that one of skill in the art would consider a multitude of factors that are not even hinted at in the specification, but that could nevertheless result in subjective disagreement over whether the resulting display is “unobtrusive” or “non-distracting.” For example, the District Court suggested that the “color, shape, or size” of the display affected whether it would be “unobtrusive” within the meaning of the claims. A12, ll. 10-13. It also opined that one of skill in the art would need to consider individual users’ “ability to focus” or “concentrate” to determine whether those specific individuals would be likely to be “distracted.” A7, ll.9-12.<sup>7</sup>

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<sup>6</sup> Apple’s iOS notifications (*supra*, p. 14) provide helpful context for considering this issue. Although the email notification may include a nominal overlap with the top portion of the address bar, it is displayed “in addition to” the primary interaction (*i.e.*, browsing the Apple website).

<sup>7</sup> Defendants invited this erroneous analysis by making the focal point of their indefiniteness argument the legally irrelevant testimony of one of Interval’s experts, Dr. Mangione-Smith. Dr. Mangione-Smith submitted a declaration containing opinions about the functions and structures that corresponded to various means-plus-function limitations. A494-506. He did not, however, offer any opinions on the meaning of the phrase “in an unobtrusive manner that does not

These hypotheticals are red herrings. Regardless of the color, shape, or size of the display, or the attention span of the user, the claim limitation is satisfied if the display occurs in an area of the display screen that is not substantially used by the user's primary activity.

*iii. Because The Intrinsic Record Provides An Objective Standard, Federal Circuit Precedent Dictates That "Unobtrusive" And "Does Not Distract" Do Not Render This Term Indefinite*

"Claim definiteness is analyzed *not in a vacuum*, but always in light of the teachings . . . of the particular application disclosure . . . ." *Energizer*, 435 F.3d at 1370 (emphasis added, quotation marks omitted). When the specification provides an objective standard for measuring the scope of claim language that might be subjective in isolation, this Court has rejected indefiniteness challenges. *See, e.g., Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1360 (Fed. Cir. 2012) (holding that a rotary cutter deck is "easily washed off" in the context of the patents if it has a "smooth, generally convex upper surface"); *Hearing Components*, 600 F.3d at 1368 (reversing the district court's holding that "readily installed and replaced"

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distract a user." *Id.* During his deposition, Defendants asked him what it meant to display an image in an unobtrusive manner *in the context of the '652 patent* and he specifically testified that he had not formed an opinion on that matter. A585, at 111:16-22. Nevertheless, they proceeded to ask him a series of questions about what factors might make displays "unobtrusive" in the abstract. His answers, although irrelevant because they are divorced from the context of the specification, became the centerpiece of Defendants' briefing and *Markman* presentation. *E.g.*, A388-390; A774-777, at 39:25-42:12.

was indefinite and relying on the specification's teaching that it referred to a hearing aid filter that is inexpensive, requires no tools for installation or removal, and was not mounted).

As explained above, the specification for the Asserted Patents dictates that a display occurs in an “unobtrusive manner that does not distract a user” within the meaning of the claims if it occurs in an area of the screen that is not substantially used by the user's primary activity. As in *Deere* and *Hearing Components*, this claim term should have been construed in accordance with this objective teaching. See *Datamize*, 417 F.3d at 1351 (“[W]hen faced with a purely subjective phrase like ‘aesthetically pleasing,’ a court must determine whether the patent's specification supplies *some standard* for measuring the scope of the phrase.” (emphasis added)).

In *Deere*, this Court rejected the defendant's argument that the subjectivity introduced by the word “easily” rendered indefinite a limitation requiring that the deck walls on a rotary cutter be “easily . . . washed off.” *Deere*, 703 F.3d at 1360. The Court held that the intrinsic record sufficiently “explains that a deck with a smooth, generally convex upper surface is ‘easily’ washed off.” *Id.* The Court did not, as the District Court incorrectly did here, introduce unwarranted subjectivity by speculating about whether a deck that fell within the specification's teaching might nevertheless *not* be “easily washed off” in some people's view. For

example, the Court’s definiteness conclusion in *Deere* did not delve into consideration of a particular user’s tools (*e.g.*, does the user have access to a hose and, if so, how strong is the water pressure?), physical attributes (*e.g.*, is the user 16 or 90 years old?), or the circumstances of their use of the rotary cutter (*e.g.*, does the user’s property contain sappy pine tree debris?). Simply put, if the deck was “smooth” and “generally convex,” the claim limitation was satisfied.

Similarly, in *Hearing Components*, this Court addressed the definiteness of a claim reciting that the wax guard on a hearing aid ear piece is “readily installed and replaced by a user.” *Hearing Components*, 600 F.3d at 1362. The district court found the claim indefinite “because the written description did not address the level of physical disability required by the terms ‘older persons’ and persons ‘advanced in years [who are] unable either to see clearly enough or to perform fine physical actions well enough to replace the filters.’” *Id.* at 1368. This Court reversed, holding that the specification’s teaching that the claimed guard is inexpensive, requires no tools for installation or removal, and is not mounted on the sound delivery tube satisfied the definiteness requirement by “suppl[ying] some standard for measuring the scope of the phrase.” *Id.* (quoting *Datamize*, 417 F.3d at 1351). It was not fatal to the claim that certain users might subjectively believe that specific wax guards that satisfied the objective standard set forth in the specification were nevertheless *not* “readily installed and replaced.” For example,

one can imagine a guard secured by a latch that could be easily manipulated by those with average dexterity but not individuals with severe arthritis. But such a possibility did not render the claims indefinite.

This Court has accordingly been clear that the use of subjective or relative terms results in indefiniteness only where the intrinsic record does not provide any reasonable guidance. Defendants inevitably will ask this Court to undermine the previously clear message of its precedents. *See Power-One*, 599 F.3d at 1348 (“Claims using relative terms . . . are insolubly ambiguous only if they provide *no guidance* to those skilled in the art as to the scope of that requirement.” (emphasis added)); *see also Deere*, 703 F.3d at 1360 (“easily . . . washed off” is not indefinite); *Star Sci., Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1374 (Fed. Cir. 2011) (“controlled environment” is not indefinite); *Hearing Components*, 600 F.3d at 1368 (“readily installed and replaced” is not indefinite); *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1336 (Fed. Cir. 2010) (“not interfering substantially” is not indefinite); *Spansion, Inc. v. ITC*, 629 F.3d 1331, 1346 (Fed. Cir. 2010) (“appreciably relieves mechanical stress” is not indefinite); *Young v. Lumenis*, 492 F.3d 1336, 1346-47 (Fed. Cir. 2007) (“near” is not indefinite); *Aero Prods. Int’l, Inc. v. Intex Recreation Corp.*, 466 F.3d 1000, 1016 (Fed. Cir. 2006) (“substantially hermetic seal” is not indefinite); *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 424 F.3d 1374, 1383 (Fed. Cir. 2005) (“improved competence” is not

indefinite). This approach makes sense in light of the presumption of validity and the importance of “protect[ing] the inventive contribution of patentees, even when the drafting of their patents has been less than ideal.” *Datamize*, 417 F.3d at 1347-48 (quoting *Exxon*, 265 F.3d at 1375).

Interval is aware of just two cases where this Court found a claim term fatally subjective, neither of which supports a finding of indefiniteness here. First, in *Datamize*, this Court held that the claim term “aesthetically pleasing” was indefinite because the asserted patent “fail[ed] to provide *any objective way* to determine whether the look and feel of an interface screen is ‘aesthetically pleasing.’” *Datamize*, 417 F.3d at 1356 (emphasis added). In that case, “[nothing] in the written description set forth an objective way to determine whether an interface screen is ‘aesthetically pleasing.’” *Id.* at 1352. Moreover, the specification “provide[d] *no guidance* to a person making aesthetic choices such that their choices will result in an ‘aesthetically pleasing’ look and feel of an interface screen.” *Id.* (emphasis added). Indeed, even the patentee proposed a construction “that only depends on the subjective opinion of a person.” *Id.* at 1349. The asserted claims in the present case do not suffer from the same infirmity as the *Datamize* claims because, as discussed above, the specification provides an “objective anchor”—the teaching that the display occurs in an area of the display

screen that is not substantially used by the user's primary activity. *See id.* at 1350-51.

Nor does *Halliburton Energy Services v. M-I LLC* suggest that a finding of indefiniteness would be appropriate here. In that case, the patentee argued that the asserted claims were distinguishable from the prior art because of the recitation of a "fragile gel" but then later admitted that this language was the only point of distinction. 514 F.3d 1244, 1253 (Fed. Cir. 2008). However, the Court found that the specification's teaching regarding how "fragile" the claimed gel must be also encompassed prior art gels. *Id.* at 1252-53. In other words, the claim was indefinite because a person of ordinary skill in the art would be unable to determine the boundary between the claim and the prior art. *Id.* at 1253. The Court's reasoning in *Halliburton* is not applicable here because (1) the language at issue does distinguish over the prior art (*e.g.*, it does not cover screen saver-based art); (2) the supposedly indefinite term is not the only distinguishing characteristic over the prior art; and (3) the specification here provides specific guidance on the meaning of "in an unobtrusive manner that does not distract a user."

*iv. The Use of the Word "Substantially" In Interval's Proposed Construction Does Not Render It Indefinite*

The District Court also erred in reasoning that Interval's inclusion of the word "substantially" in its construction supported an indefiniteness finding. A13-14. As this Court pointed out in *Deere*, it "has repeatedly confirmed that relative

terms such as ‘substantially’ do not render patent claims so unclear as to prevent a person of skill in the art from ascertaining the scope of the claim.” 703 F.3d at 1359; *see also id.* (“substantially planar” is not indefinite); *Enzo*, 599 F.3d at 1336 (“not interfering substantially” is not indefinite); *Aero*, 466 F.3d at 1016 (“substantially hermetic seal” is not indefinite); *Exxon*, 265 F.3d at 1381 (“substantial absence of slug flow” is not indefinite); *Andrew Corp. v. Gabriel Electronics, Inc.*, 847 F.2d 819, 821 (1988) (“substantially equal” is not indefinite).

When evaluating the definiteness of the term “substantial,” this Court has explained that “only a reasonable degree of particularity and definiteness” is required; “mathematical precision” is not. *See Exxon*, 265 F.3d at 1381; *see also Power-One*, 599 F.3d at 1348 (“Claims using relative terms . . . are insolubly ambiguous only if they provide *no guidance* to those skilled in the art as to the scope of that requirement.” (emphasis added)).

As discussed above, the specification of the Asserted Patents enables those of skill in the art to ascertain what is meant by “substantial”: Any overlap between the display generated by the attention manager “in an unobtrusive manner that does not distract a user” and the area of the screen occupied by the user’s primary interaction must be sufficiently minimal so as to avoid interfering with the user’s on-going activities. This guidance satisfies the requirements of § 112, ¶ 2. *See Exxon*, 265 F.3d at 1381 (affirming definiteness of “substantial absence of slug



flow” because “[o]ne of skill in the art would understand from the specification that the reason slug flow should be avoided is that it may interfere with reactor efficiency”); *see also Enzo*, 599 F.3d at 1335 (“Because the intrinsic evidence here provides a general guideline and examples sufficient to enable a person of ordinary skill in the art to determine the scope of the claims, the claims are not indefinite even though the construction of the term ‘not interfering substantially’ defines the term without reference to a precise numerical measurement.” (brackets, quotation marks and citations omitted)).

Any disputes about whether a particular amount of overlap is “substantial” in the context of the accused products are properly resolved by the jury when deciding infringement. *See Andrew Corp.*, 847 F.2d at 822-23 (“[A]n imprecise claim limitation, such as ‘about 100% per second’ does not impart invalidity to the claims, but is to be considered in determination of infringement.” (quoting *W.L. Gore & Assocs., Inc. v. Garlock*, 842 F.2d 1275, 1280 (Fed. Cir. 1988))); *see also Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 806 (Fed. Cir. 2007) (explaining that the question of “how ‘sharp’ is too sharp” when applying a claim construction is a “line-drawing problem” that “is properly left to the trier of fact”).<sup>8</sup>

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<sup>8</sup> Indeed, if the Court rejects adding the word “substantial” but allows the narrowing definition discussed below that comes from an exemplary example in the specification, a jury will still have to decide the substantial overlap point as part of the doctrine of equivalents analysis.

*B. Alternatively, Before This Term Is Held Indefinite, It Must Be Limited To The Specific Example Provided In The Specification*

For the reasons given above, this Court should hold that the term in an “unobtrusive manner that does not distract a user” is not indefinite. Such a display occurs in an area of the display screen that is not substantially used by the user’s primary activity. To the extent the Court does not accept that interpretation, the correct approach is not to declare the term indefinite (as the District Court did) but to adopt a proper narrowing construction. *Exxon*, 265 F.3d at 1375 (A claim is indefinite only if it “is insolubly ambiguous, *and no narrowing construction can properly be adopted.*” (emphasis added)); *Datamize*, 417 F.3d at 1347 (“[T]he definiteness of claim terms depends on whether those terms can be given *any reasonable meaning.*” (emphasis added)).

The District Court’s judgment thus must be reversed because, at the very least, the specification provides a narrow example that can justify an entirely objective construction: “the information is presented in areas of a display screen that are not used by displayed information associated with the primary interaction.” *See*, ’652 Patent, at 2:15-19 (A41), 6:41-45 (A43). Interval believes this language is exemplary, and the specification and this Court’s precedents permit the claims to encompass insubstantial overlap between the areas of the screen used by the attention manager and the primary interaction. *See supra*, pp. 28-29. However, if the Court concludes that the construction should not include the word

“substantially,” the Court should construe the term as limited to this specific example rather than invalidating Interval’s claims.

For example, in *Kinetic Concepts, Inc. v. Blue Sky Medical Group, Inc.*, the Court addressed the argument that a claim requiring a “reduction in bacterial density in the wound by at least 50%” was indefinite because “there are several methods for measuring bacterial density, each of which may yield a drastically different result.” 554 F.3d 1010, 1022 (Fed. Cir. 2009). Rather than finding the claim invalid for this reason, the Court held that one of ordinary skill in the art would know to use the “particular method” described in Example 2 of the specification. *Id.* In other words, the limitation was narrowly interpreted to be satisfied only if the exemplary method described in the specification yielded a determination that the bacterial density had been reduced by 50%. Conversely, even if other methods would result in a determination that a 50% reduction had occurred, the limitation would *not* be satisfied if the exemplary method did not also provide the same result.

In the present case, the specification provides a specific and entirely objective example of how to display information “in an unobtrusive manner that does not distract a user.” To the extent the Court concludes that the term or Interval’s proposed construction is too subjective, Interval respectfully requests that the Court construe this term to mean “the information is presented in areas of a

display screen that are not used by displayed information associated with the primary interaction.” *See* ’652 Patent, at 2:15-19 (A41), 6:41-45 (A43).

*C. The Proper Construction Of “In An Unobtrusive Manner That Does Not Distract A User” Does Not Encompass The Screen Saver Embodiment*

Although seemingly unnecessary to its indefiniteness holding, the District Court also expressed its view that the “unobtrusive manner that does not distract a user” language encompasses the “screen saver embodiment” described in the specification. A13, ll.3-15. The scope of this language is of significant importance to Defendants’ anticipation and obviousness allegations, which run counter to the determinations made in the reexaminations where the examiner confirmed the validity of all asserted claims containing this limitation after concluding that screen saver-type prior art was not encompassed by these claims. Interval respectfully requests that the Court correct this error to ensure that the proceedings on remand do not necessitate another appeal on this point.

As explained in detail above, the specification expressly distinguishes between the “screen saver embodiment” and the “wallpaper embodiment.” Each of these embodiments is an “attention manager,” but only the latter is described as displaying information “in an unobtrusive manner that does not distract a user.” *See supra*, pp. 23-27; ’652 Patent, at 2:3-19 (A41), 6:34-51 (A43). The District Court misinterpreted a portion of the specification explaining that an “attention manager” (which may practice either embodiment) can use unused capacity in

either the temporal dimension (*i.e.*, the “screen saver embodiment”) or spatial dimension (*i.e.*, the “wallpaper embodiment”). *See* A13, ll. 4-14; ’652 Patent, at 6:34-51 (A43). Specifically, the District Court read the portion of the specification at column 6, lines 45-51 as if it were modified as follows:

Generally, then, an attention manager a display in an unobtrusive manner that does not distract a user according to the invention makes use of “unused capacity” of a display device, “unused capacity” being defined broadly to include, for example, the embodiments mentioned above, *i.e.*, both temporal (*e.g.*, the first-described embodiment above) and spatial (*e.g.*, the second-described embodiment above) dimensions.

*See* ’652 Patent, at 6:45-51 (A43).

The file history confirms Interval’s interpretation. During the original prosecution, the examiner expressly recognized the two embodiments and noted that only one of them displayed in an “unobtrusive manner”:

***Response to Arguments***

6. This display of content data in this application has two main modes of operation:
- (1) display content data during inactive periods (screen saver embodiment) (Goodhead and Frieberger make allegations in the declarations, Piernot provides facts for screen saver embodiment in the declarations); and
  - (2) display content data in unobtrusive manner (wallpaper embodiment and display area embodiment) (Piernot provides facts for wallpaper and display area embodiments in the declarations).

A1073.<sup>9</sup>

During the reexaminations requested by Defendants, the question of whether screen savers displayed “in an unobtrusive manner that does not distract a user” within the meaning of the patents was front and center. Again, the examiner recognized that Interval’s interpretation was correct even under the rule that the USPTO must apply the “broadest reasonable construction” (which, of course, should be broader than the actual construction that would be applied during litigation). *See In re Suitco Surface, Inc.*, 603 F.3d 1255, 1259 (Fed. Cir. 2010); *In re Yamamoto*, 740 F.2d 1569, 1571 (Fed. Cir. 1984) (explaining that the USPTO “broadly interprets claims during examination” to “reduc[e] the possibility that claims, finally allowed, will be given broader scope than is justified.”).

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<sup>9</sup> In the original prosecution, the applicant made certain statements that confusingly suggested that the screen saver embodiment displayed “in an unobtrusive manner.” *See* A985, A1012. These few confusing statements should not be given controlling weight because (1) as the above-cited excerpt indicates, the examiner clearly understood the correct interpretation (A1073); (2) even if the examiner had not understood the correct interpretation, all that means is that he would have examined the claims under an overly *broad* interpretation and would have considered *more* prior art (*i.e.*, screen saver-type prior art); (3) the reexamination history, described in detail below, is also part of the intrinsic record and is unequivocal about the correct interpretation; and (4) as explained above, the clear teaching of the specification controls even if the prosecution history is confusing. *See Boss Control, Inc. v. Bombardier Inc.*, 410 F.3d 1372, 1378 (Fed. Cir. 2005) (“Neither the dictionary definition nor the prosecution history, however, overcomes the particular meaning . . . clearly set forth in the specification.”).

Specifically, the examiner during the reexamination of the '652 patent explained that the language “in an unobtrusive manner that does not distract a user” does not describe the screen saver embodiment:

The '652 patent specification discloses two embodiments wherein the attention manager makes use of “unused capacity” of the display device. The first is the “screensaver embodiment” wherein the information can be presented to a person while the apparatus (e.g. computer) is operating, but during inactive periods (i.e., when a user is not engaged in an intensive interaction with the apparatus). (col. 2:8-12)

The second is the “wallpaper embodiment” wherein information can be presented to the person during active periods (i.e. when a user is engaged in an intensive interaction with the apparatus) but in an unobtrusive manner that does not distract the user from the primary interaction with the device (e.g. the information is presented in areas of a display screen that are not used by displayed information associated with the primary interaction with the apparatus). (col. 2:12-18)

Independent claim 4 claims *means for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data* in combination with the other limitations of the claim. As such, the broadest reasonable interpretation of independent claim 4, in light of the specification, excludes the screensaver embodiment because the claim language “*in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus*” is consistently and repeatedly linked to the ‘wallpaper embodiment’ and excludes the ‘screensaver embodiment’. (see also col. 3:20-40, col. 6:34-52, and col. 13:10-15).

A1090-91 (emphasis in original). The examiner reached the same conclusion in the '314 patent reexamination. See A1311-12 (“[I]t is agreed that the totality of the

specification evidence supports an argument that the broadest reasonable interpretation of the claims, in light of the specification, excludes the ‘screensaver embodiment.’”).

Interval’s arguments during the reexamination and the USPTO’s agreement with those arguments are part of the intrinsic record and leave no room for doubt that the term “in an unobtrusive manner that does not distract a user” does not encompass screen saver-type displays. *See Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1363 (Fed. Cir. 2012); *Krippelz v. Ford Motor Co.*, 667 F.3d 1261, 1267 (Fed. Cir. 2012).

### **III. The Specification Discloses Sufficient Structure Corresponding To The “Means For Selectively Displaying On The Display Device, In An Unobtrusive Manner That Does Not Distract A User Of The Apparatus From A Primary Interaction With The Apparatus, An Image Or Images Generated From The Set Of Content Data”**

Section 112, ¶ 6 of the Patent Act permits a claim limitation to be “expressed as a means . . . for performing a specified function without the recital of structure . . . in support thereof.” 35 U.S.C. § 112, ¶ 6. In such cases, the claim limitation “shall be construed to cover the corresponding structure . . . described in the specification and equivalents thereof.” *Id.* The parties agree that the claim term “means for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction



with the apparatus, an image or images generated from the set of content data” is governed by Section 112, ¶ 6.

When means-plus-function claiming is used in the context of computer and software inventions, the corresponding structure cannot simply be a “general purpose computer.” *WMS Gaming Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999). Instead, the structure must be a “special purpose computer” that is programmed according to an “algorithm” disclosed in the written description that performs the recited function. *Id.* Otherwise, the means-plus-function limitation is indefinite. *In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994).

An “‘algorithm’ in computer systems has broad meaning, for it encompasses ‘in essence a series of instructions for the computer to follow,’ whether in mathematical formula, or a word description of the procedure to be implemented by a suitably programmed computer.” *Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1384 (Fed. Cir. 2011) (quoting *In re Waldbaum*, 457 F.3d 997, 998 (C.C.P.A. 1972)). “Precedent and practice permit a patentee to express that procedural algorithm ‘in any understandable terms including as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure.’” *Id.* at 1385 (quoting *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1340 (Fed. Cir. 2008)). Moreover, the specification need not describe the algorithm with perfect and absolute specificity because it is permissible for

“[a]spects of this algorithm [to] vary based on implementation.” *Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1254 (Fed. Cir. 2005).

In this case, the parties agreed that the function associated with this means-plus-function limitation is “selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data.” Once the correct meaning of “in an unobtrusive manner that does not distract a user” is established as discussed above, it follows that the specification describes an algorithm for performing this function that informs one of skill in the art of the bounds of this claim limitation.

The specification first explains that the structure that performs the function is a specially programmed computer. *See, e.g.*, ’652 Patent, at 8:2-6 (A44), 14:12-14 (A47), 18:41-45 (A49), 24:61-66 (A52). It also describes how the “selective displaying” function is implemented:

A set or sets of instructions for enabling a display device to selectively display an image or images generated from a set of content data are also made available for use by the content display systems. Typically, the instructions enable images generated from content data to be displayed automatically, without user intervention, in a predetermined manner, thereby enhancing the capability of the invention to occupy the user’s peripheral attention.

’652 Patent, at 2:35-42 (A41).

Fig. 5A and its accompanying description in the specification set forth an algorithm that includes steps for accomplishing this function. Specifically, in step 521, the system determines which set of content data is to be displayed next. *Id.* at Fig. 5A (A37). In step 105, the next set of content data is displayed. *Id.* The specification teaches that the function of displaying it “in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus” is performed by displaying it in an area of the display screen that is not substantially used by the user’s primary activity. *See* ’652 Patent, at 2:12-19 (A41); 3:25-31 (A42); 6:38-51 (A43).

This description of the algorithm in the specification, which is set forth by a combination of flowchart steps and “a word description of the procedure to be implemented by a suitably programmed computer” comports with this Court’s precedent. *See Typhoon Touch*, 659 F.3d at 1384-85. It does not implicate the concerns about “pure functional claiming” that led to indefiniteness in prior cases such as *Aristocrat Technologies Australia Pty Limited v. International Game Technology*, 521 F.3d 1328, 1333 (Fed. Cir. 2008).

In *Aristocrat* and its progeny, the patentees asserted that the means-plus-function limitations extended to *any* general purpose computer that could perform a broad function. For example, in *Aristocrat*, the patentee argued that the structure was any computer with “appropriate programming”:

In this case, Aristocrat acknowledges that the only portion of the specification that describes the structure corresponding to the three functions performed by the “control means” is the statement that it is within the capability of a worker in the art “to introduce the methodology on any standard microprocessor base [sic] gaming machine by means of appropriate programming.” ‘102 patent, col. 3, ll. 2-4. That description goes no farther than saying that the claimed functions are performed by a general purpose computer. The reference to “appropriate programming” imposes no limitation whatever, as any general purpose computer must be programmed.

*Id.* at 1334. In other words, the alleged structure was actually just a “general purpose computer,” which this Court held was insufficient in *WMS Gaming*. *See* 184 F.3d at 1349.

Similarly, in *Net MoneyIn, Inc. v. Verisign, Inc.*, there was no description in the specification of how the general purpose computer was to perform the recited function of “generating an authorization indicia.” 545 F.3d 1359, 1366-67 (Fed. Cir. 2008); *see also id.* at 1367 n.3 (noting that counsel for the patentee conceded “[t]here is nothing in the written description that expressly states what is going on inside that bank computer”).

In these cases, the claims were found invalid because they amounted to “pure functional claiming.” *E.g.*, *Aristocrat*, 521 F.3d at 1333; *Net MoneyIn*, 545 F.3d at 1367; *see also Ergo Licensing, LLC v. CareFusion 303, Inc.*, 673 F.3d 1361, 1363 (Fed. Cir. 2012) (“Failure to specify the corresponding structure in the specification amounts to impermissible pure functional claiming.”).

This case is very different. The claimed structure is not any “general purpose computer.” Instead, it is the special purpose computer that has been programmed to perform the function by (1) identifying the next set of content data in a schedule; and (2) displaying an image of the content data in an area of the display screen that is not substantially used by the user’s primary activity. This specific algorithm confines the scope of the means-plus-function limitation to a particular way of implementing the display that is understandable to those of skill in the art. *See AllVoice Computing PLC v. Nuance Commc’ns, Inc.*, 504 F.3d 1236, 1245 (Fed. Cir. 2007) (“In software cases, therefore, algorithms in the specification need only disclose adequate defining structure to render the bounds of the claim understandable to one of ordinary skill in the art.”).

#### **IV. The Claim Term “Attention Manager” Was Incorrectly Construed As Limited To Two Specific Embodiments Described In The Specification**

“Attention manager” is the name given by the Asserted Patents to a system that, according to the invention, obtains, schedules, and displays information to a user in one or more ways that do not interfere with the user’s other activities on the computer. *See* ’652 Patent, Abstract (A32). As described in the preceding sections, an attention manager displays information using the “unused capacity” of the display device, in either the temporal or spatial dimension. *See supra*, pp. 24-27. Stated differently, it either displays information at a *time* when the user is not

actively using the device, or in an *area* of the display screen that is not substantially used by the user's primary activity. *Id.*

By construing this term to mean “a system that displays images to a user either when the program detects that the user is not engaged in a primary interaction or as a background of the computer screen,” the District Court construed “attention manager” to cover just one possible implementation of the “temporal” embodiment and one possible implementation of the “spatial” embodiment. *See* A18. The District Court's construction is incorrect because it limits each disclosed class of embodiment to one particular example—*i.e.*, a screen saver activated after detection of an idle period (for the temporal embodiment) and display on the “background of the computer screen” (for the spatial embodiment)—and excludes all other possible implementations, including some expressly described in the specification. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) (an interpretation that excludes a preferred embodiment is “rarely, if ever, correct”).

With respect to the temporal embodiment, the specification describes that it can be activated by *either* “detection of an idle period” *or* by intentional activation by the user (*e.g.*, clicking on an icon). '652 Patent, at 9:23-37 (A45). In the latter example, a user who knows he is about to stop his active use of the device can immediately begin operation of the attention manager by intentionally launching

the program. By requiring that the system “detects that the user is not engaged in a primary interaction,” the portion of the District Court’s construction relating to the temporal embodiment incorrectly excludes an embodiment expressly taught in the specification. *See Vitronics*, 90 F.3d at 1583.

The description of the spatial embodiment in the District Court’s construction is also too narrow. The specification describes the spatial embodiment as encompassing the presentation of information in any unused area of the display. *See* ‘652 Patent, at 2:17-19 (“e.g., the information is presented in areas of a display screen that are not used by displayed information associated with the primary interaction with the apparatus”) (A41); *id.* at 3:25-31 (describing that images related to the primary interaction are displayed “in addition to” images displayed by the attention manager) (A42); *id.* at 7:45-48 (display may take the place of “extraneous information”) (A44). Yet the District Court’s construction only covers display “as a background of the computer screen,” which excludes embodiments that, for example, display the information in a small window at the periphery of the screen.

The District Court’s error with respect to this embodiment appears to stem from the fact that the Background of the Invention section of the specification references “‘wallpaper’ (i.e., a pattern generated in the background portions on a computer display).” ‘652 Patent, at 1:50-52 (A41). Later, the specification defines

“the ‘wallpaper embodiment’” as short-hand nomenclature referring to the spatial embodiment. *Id.* at 3:25-31 (A42). But the latter section makes clear that the “wallpaper embodiment” is broader than just display “as a background of the computer screen”:

According to another further aspect of the invention, the selective display of an image or images occurs while the user is engaged in a primary interaction with the apparatus, *which primary interaction can result in the display of an image or images in addition to the image or images generated from the set of content data* (the “wallpaper embodiment”).

*Id.* (emphasis added). In other words, the defined “wallpaper embodiment” covers an embodiment where the images from the “primary interaction” are displayed “in addition to” the images created by the attention manager—not just embodiments where the attention manager display images “as a background of the computer screen.”

The correct construction of “attention manager” should reflect the meaning set forth in the specification, which is broader than the two specific implementations captured by the District Court’s construction. Interval proposed that “attention manager” be construed as “a system for engaging at least part of the user’s attention that is not occupied by the user’s primary interaction with the apparatus.” A18. Interval reached this proposal by starting with the express definition of “attention manager” in the Abstract: “An attention manager presents information to a person in the vicinity of a display device in a manner that engages



at least the peripheral attention of the person.” ‘652 Patent, Abstract. Interval then replaced the reference to “the peripheral attention of the person” with the parties’ agreed construction—“a part of the user’s attention that is not occupied by the user’s primary interaction with the apparatus.” A886.

Interval’s construction follows this Court’s precedent by relying upon the lexicographical definition of “attention manager” in the Abstract. *See Phillips*, 415 F.3d at 1321 (“[T]he specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.” (quotation marks omitted)). It appears that the District Court found Interval’s proposed construction unhelpful because it did not specifically reference the “screen saver” and “wallpaper” embodiments. A18-19.

To the extent this Court agrees that the construction should make reference to the temporal and spatial embodiments even though it is not necessary, Interval is agreeable as long as the construction reflects the correct scope. One possibility is to revise the District Court’s construction to remove or modify the overly narrow limitations, resulting in the following construction: “During operation of a system that displays images to a user either when the user is not engaged in a primary

interaction or in an area of the display screen that is not substantially used by the user's primary activity.”<sup>10</sup>

## V. The District Court’s Construction Of “Instructions,” Which Is Based On A Dictionary Definition, Is Erroneous

Although the District Court’s construction of “instructions” was not dispositive with respect to the final judgment of invalidity and non-infringement, Interval respectfully requests that the Court also review this construction. The term “instructions” appears in many of the asserted claims, and the District Court’s construction, which was proposed by Defendants based on a dictionary definition, invites improper non-infringement arguments that are inconsistent with the teaching of the specification. Correcting this construction now will streamline the case and avoid the potential necessity for a subsequent appeal. *See Deere*, 703 F.3d at 1357 (addressing “additional claim construction arguments” that “may become important on remand”).

The District Court construed “instructions” to mean “a statement in a programming language that specifies a function to be performed by a system.”

A27. This construction was proposed by Defendants based on the second

<sup>10</sup> This Court may properly provide the correct construction even if it was not proposed by either party or the trial court. *See Exxon Chem. Patents v. Lubrizol Corp.*, 64 F.3d 1553, 1560 (Fed. Cir. 1995) (“When we determine on appeal, as a matter of law, that a trial judge has misinterpreted a patent claim, we independently construe the claim to determine its correct meaning . . .”).

definition of “computer instruction” in the IEEE Standard Dictionary of Electrical and Electronics Terms. A419, A484. The problem with this construction is that it is highly likely that Defendants will apply the language “a statement in a programming language” in a way that cannot be reconciled with the teaching of the intrinsic record. This Court recognized this problem in its *en banc* decision in *Phillips v. AWH Corp.*:

The main problem with elevating the dictionary to such prominence is that it focuses the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent. Properly viewed, the “ordinary meaning” of a claim term is its meaning to the ordinary artisan after reading the entire patent. Yet heavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract, out of its particular context, which is the specification.

415 F.3d at 1321.

Specifically, Defendants are likely to seize on the language requiring a “statement in a programming language” to argue on summary judgment or to the jury that data that directs a computer to perform a specific function is not an “instruction.”<sup>11</sup> Although this argument is inconsistent with the intrinsic evidence,

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<sup>11</sup> Defendants may also take the position that compiled object code, which is the string of 1’s and 0’s that a computer executes, is not a “programming language” because programmers generally do not write programs in that form. Instead, programs are generally written in a higher level language such as C—called “source code”—and then converted to 1’s and 0’s by a compiler. Defendants might argue that their devices do not satisfy the “instructions” limitations of the computer readable medium claims (*e.g.*, claims 15-18 of the ’652 patent) because

the District Court rejected Interval's proposal, which reflected the fact that certain data could be an "instruction" in the context of the patents,<sup>12</sup> and adopted Defendants' proposal verbatim.

The specification and prosecution history both recognize that, in the context of the invention, data can be an "instruction" if it causes the accomplishment of a function. The specification includes several figures, including Fig. 3A below, that identify types of "instructions":

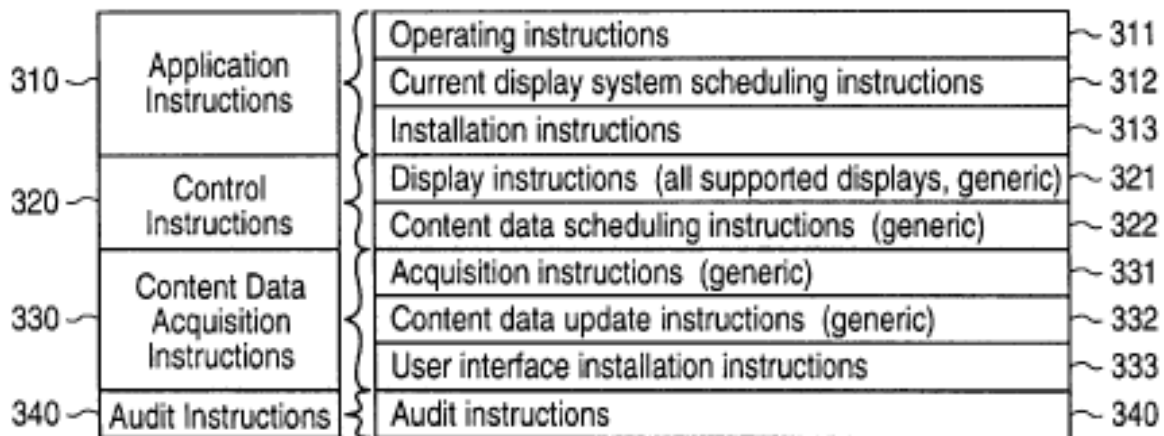


FIG. 3A

those devices contain only compiled object code (1's and 0's) and not the source code written in C by the programmers. Such an argument makes no sense when viewed in the context of the specification, which refers to the "instructions" being "executed." *E.g.*, '652 Patent, at 24:12-20 (referencing "content data update instructions" being "executed") (A52). Source code written in a "programming language" such as C, however, is not executed. Instead, it is compiled and then the compiled object code is executed.

<sup>12</sup> Interval's proposed construction was: "Either (a) data related to the accomplishment of a function and/or (b) a statement or expression that can be interpreted by a computer that specifies a function to be performed by a system." A27.

The patents also refer to these “instructions” in Fig. 3A as “functional components.” ’652 Patent, at 14:49-53 (“FIGS. 3A, 3B and 3C are schematic diagrams illustrating the functional components . . . according to an embodiment of the invention.”) (A47). The specification then explains that each “functional component” may be represented by “data” that is used by the attention manager to accomplish a function:

*Each of the functional components are represented by a set of instructions and/or data. (In particular, each of the sets of instructions may include, if appropriate, data related to accomplishment of the functions associated with the set of instructions . . . .)*

*Id.* at 14:53-57 (emphasis added) (A47). The next sentence describes two ways in which these functional components can be implemented:

*Each of these sets of instructions and/or data can be embodied in [1] an appropriate computer program or set of computer instructions (the latter capable of including computer instructions and data), or [2] an appropriate set of data configured for use by a set or sets of instructions (e.g., computer program) that must interact with the set of data in order to implement the attention manager.*

*Id.* at 14:59-65 (emphasis and bracketed enumeration added). As the alternative identified by the bracketed [2] indicates, each of the functional components (which are identified as types of “instructions” in Fig. 3A) can be implemented by an “appropriate set of data” that is used by the attention manager to perform the function.

An Office Action issued by the USPTO examiner during the prosecution of the '314 patent illustrates how an “appropriate set of data” could serve as an “instruction” in this manner. The examiner relied on the Farber patent to reject claims that included a limitation that content providers “may provide scheduling instructions tailored to the set of content data to control at least one of the duration, sequencing, and timing of the display of said image . . .” A1214-15. According to the examiner, Farber taught “having content providers continuously connected to the content display system” such that the content provider could “control when new content is displayed” by sending new content data. *Id.* In other words, according to the protocols of such a system, the new content data itself constituted an instruction to “display [the] new information now or soon.” *Id.* at 1215. The examiner reasoned that newly provided data in the Farber system therefore constituted “scheduling instructions” within the meaning of the limitation because it controlled the “timing” of the display. *Id.*; *see also* A1207 (“new information is an instruction to display new information”).

The District Court erred by adopting a rigid distinction between “instructions” and “data.” A27 (“In other words, instructions might include data, *but instructions cannot be data alone.*” (emphasis added)). This is not supported by either the intrinsic or extrinsic evidence. As described above, for example, the “content data scheduling instructions” shown in Fig. 3A—which are analogous to a

limitation recited in claims 15-18 of the '652 Patent—are referred to in the patents as a “functional component,” and the specification expressly says that each “functional component” can be composed of “data.” *See* '652 Patent, at Fig. 3A (A35), 14:49-65 (A47). And the prosecution history describes how data alone could be a “scheduling instruction” if the system protocol uses it to determine when to display the information (*e.g.*, as soon as it is received). *See* A1214-15.

The District Court rejected Interval’s reliance on this portion of the '314 prosecution history because, in its view, “this statement, made in a parenthetical and discussing a different patent, nowhere says that information alone can constitute an ‘instruction.’” A28. There are two clear errors in this reasoning.

*First*, the term “instructions” appears in each of the claims of the '314 patent and, as the Joint Claim Construction And Prehearing Statement filed with the District Court indicates, the construction of “instructions” is applicable to the '314 patent claims. *See* A888. The prosecution history of the '314 patent is therefore very relevant and should not be discounted as related to “a different patent.” Additionally, the '314 and '652 patents share the same specification. The file history of one is hardly “irrelevant” to the other, and to hold otherwise is contrary to basic principles of claim construction. *See Adv. Cardiovascular Sys. v. Medtronic, Inc.*, 265 F.3d 1294, 1305 (Fed. Cir. 2001) (“The prosecution history of

a related patent can be relevant if, for example, it addresses a limitation in common with the patent in suit.”).

*Second*, the prosecution history *does* say “that information alone can constitute an ‘instruction’”; specifically, it says both (1) “new information is an instruction to display new information” (A1207); and (2) “new content data sent from the server . . . indicates a timing, such as display new information now or soon” (A1215). Simply put, the intrinsic evidence demonstrates that “instructions” in the context of the invention *can* consist of “data alone.” *See Phillips*, 415 F.3d at 1313-14 (emphasizing the importance of the intrinsic record in the claim construction analysis).

The District Court’s construction based on a definition from the IEEE Dictionary does not reflect how the term “instructions” is used in the intrinsic record. That is precisely the error that this Court warned of in its *en banc Phillips* opinion, where it held that prior cases had “placed too much reliance on extrinsic sources such as dictionaries.” *Id.* at 1320. In so holding, this Court explained that “undue reliance on extrinsic evidence poses the risk that it will be used to change the meaning of claims in derogation of the indisputable public records consisting of the claims, the specification and the prosecution history . . . .” *Id.* at 1319-20 (quotation marks omitted).



Moreover, even the IEEE Dictionary does not support the District Court's sweeping conclusion that "data" cannot be an "instruction." A27. Instead, that same dictionary defines "data" as "a representation of facts, concepts, *or instructions* in a manner suitable for communication, interpretation, or processing by humans or by automatic means." A1685, A849 (114:16-22) (emphasis added). Therefore, even this extrinsic evidence supports Interval's position that the construction of "instructions" must be broad enough to encompass certain data.

Presumably because the IEEE Dictionary's definition of "data" supports Interval, Defendants switched to the Oxford Dictionary's definition of "data" to support their argument that "data" and "instructions" are mutually exclusive at the *Markman* hearing. *See* A844-845 (109:21-110:9). This selective use of dictionaries provides a good example of the danger of over-reliance on extrinsic evidence. *See Phillips*, 415 F.3d at 1322 ("A claim should not rise or fall based upon the preferences of a particular dictionary editor, or the court's independent decision, uninformed by the specification, to rely on one dictionary rather than another.").

In order to avert the possibility of moving forward on remand under an incorrect claim construction that could easily require a subsequent appeal, Interval respectfully requests that this Court clarify that "instructions" in the context of the

Asserted Patents need not be written “in a programming language” and may encompass “data.”

### **CONCLUSION & STATEMENT OF RELIEF SOUGHT**

For the reasons stated herein, Interval respectfully requests that the Court:

- (1) reverse the District Court’s holding that the claim term “in an unobtrusive manner that does not distract a user” is indefinite;
- (2) construe the term “in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus” to mean “during a user’s primary interaction with the apparatus and the information is presented in an area of the display screen not substantially used by displayed information associated with the primary interaction of the user”;
- (3) reverse the District Court’s holding that the claim term “means for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data” is indefinite;
- (4) construe the structure corresponding to the “means for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the

apparatus, an image or images generated from the set of content data”  
to be “one or more digital computers programmed to identify the next  
set of content data in the schedule and display the next set of content  
data in the schedule in an ‘unobtrusive manner that does not distract a  
user of the apparatus from a primary interaction with the apparatus’  
[as construed above].”

- (5) vacate the District Court’s construction of “during operation of an  
attention manager” and construe this term to mean “during the  
operation of a system for engaging at least part of the user’s attention  
that is not occupied by the user’s primary interaction with the  
apparatus” or “during operation of a system that displays images to a  
user either when the user is not engaged in a primary interaction or in  
an area of the display screen that is not substantially used by the  
user’s primary activity.”
- (6) clarify that “instructions” in the context of the Asserted Patents may  
encompass certain “data” and need not be written “in a programming  
language.”

Respectfully submitted,

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June 27, 2013

## **ADDENDUM**

UNITED STATES DISTRICT COURT  
WESTERN DISTRICT OF WASHINGTON  
AT SEATTLE

INTERVAL LICENSING, LLC,

Plaintiff,

v.

AOL, INC., et al.,

Defendants.

LEAD CASE NO. C10-1385MJP

CLAIM CONSTRUCTION ORDER

This matter comes before the Court on the opening and responsive claim construction briefs provided by the parties. (Dkt. Nos. 300, 301, 311, 315.) Having reviewed the briefs and all related papers, and having held a tutorial hearing on December 10, 2012, and a Markman hearing on December 12, 2012, the Court hereby enters the following ORDER:

The Court finds the terms “unobtrusive manner” and “does not distract a user” are indefinite, and finds that the claims containing these terms are therefore invalid under 35 U.S.C. § 112 ¶ 2. The Court adopts Plaintiff’s proposed construction of disputed terms 2, 6, 7, 9, 10, 11, 12, 13, and 15. The Court adopts Defendants’ proposed construction of disputed terms 3, 5, 8, and 14.

## Background

The two patents at issue in this litigation disclose an “attention manager for occupying the peripheral attention of a person in the vicinity of a display device.” U.S. Patent No. 6,034,652 (the “‘652 Patent”); U.S. Patent No. 6,788,314 (the “‘314 Patent”). The ‘314 Patent is a continuation of the ‘652 Patent, and the two patents share a common specification. The inventions described in the two patents are aimed at providing information to users in non-distracting ways that do not interfere with the user’s primary activity on a device such as a computer. (Dkt. No. 300 at 6.<sup>1</sup>) The inventions are intended to “improve users’ ability to take advantage of available information by allowing for the flow of other sources of information that they otherwise would not see.” (*Id.*)

Plaintiff Interval Licensing is the licensing arm of Interval Research Corporation, founded in 1992 by Paul Allen and David Liddle to perform advanced research and development in the areas of information systems, communications, and computer science. (Dkt. No. 153 at 4.) Interval Research was issued approximately 300 patents in less than a decade. (*Id.*) In the present litigation, Plaintiff brings suit against eleven Defendants: AOL, Inc.; Apple, Inc.; eBay, Inc.; Facebook, Inc.; Google, Inc.; Netflix, Inc.; Office Depot, Inc.; OfficeMax, Inc.; Staples, Inc.; Yahoo!, Inc.; and YouTube, LLC. (*Id.* at 2-4.) Plaintiff alleges Defendants are infringing four patents. (*Id.* at 5.) The Court has divided the litigation into two tracks, staying the track concerning U.S. Patent Nos. 6,263,507 and 6,757,682, but lifting the stay on the track concerning the ‘652 and ‘314 Patents. (Dkt. No. 269 at 2.) In this track, the parties have agreed to

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<sup>1</sup> This litigation includes a number of related cases. The references here refer to docket numbers in the lead case, Case No. C10-1385MJP.

1 construction for eleven terms. (Dkt. No. 300 at 9.) The parties dispute the constructions of 13  
2 remaining terms. (Id.)

### 3 Discussion

#### 4 A. Legal Standard

5 It is a “bedrock principle” of patent law that “the claims of a patent define the invention  
6 to which the patentee is entitled to the right to exclude.” Philips v. AWH Corp., 415 F.3d 1303,  
7 1312 (Fed. Cir. 2005) (en banc) (citations omitted). The words of a patent claim “are generally  
8 given their ordinary and customary meaning.” Vitriolics Corp. v. Conceptronic, Inc., 90 F.3d  
9 1576 (Fed. Cir. 1996). The ordinary and customary meaning of a claim term is the meaning that  
10 the term would have to a person of ordinary skill in the art in question at the time of the  
11 invention. Phillips, 415 F.3d at 1313.

12 The Court has the sole responsibility for construing patent claims. See Markman v.  
13 Westview Instruments, Inc., 517 U.S. 370 (1996). The Federal Circuit has established a clear  
14 hierarchy of sources to guide courts in claim construction. First, if a claim term is non-technical  
15 and derives no special meaning from the patent and its prosecution history, the court need not  
16 construe it. See U.S. Surgical Corp. v. Ethicon, Inc., 103 F.3d 1554, 1568 (Fed. Cir. 1997).  
17 However, if a jury might otherwise misunderstand a claim term in the context of the patent and  
18 its file history, courts are to “read the claim term not only in the context of the particular claim in  
19 which the disputed term appears, but in the context of the entire patent, including the  
20 specification.” Phillips, 415 F.3d at 1313. The Federal Circuit has affirmed that “the best source  
21 for understanding a technical term is the specification from which it arose, informed, as needed,  
22 by the prosecution history.” Phillips, 415 F.3d at 1315.

23 Intrinsic evidence—the specification and prosecution history—is the primary source for  
24 understanding claim terms. Phillips, 415 F.3d at 1315. Courts are also authorized to consider



“evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” Id. However, “while extrinsic evidence can shed useful light on the relevant art . . . it is less significant than the intrinsic record in determining the legally operative meaning of claim language. Id. (internal quotations and citations omitted).

Disputed terms 5, 9, and 15 are means-plus-function limitations. Title 35 U.S.C. § 112 provides that “[a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” 35 U.S.C. § 112 ¶ 6 (2000). Construing a means-plus-function limitation is a two-step process. Asyst Techs., Inc. v. Empak, Inc., 268 F.3d 1364, 1369 (Fed. Cir. 2001). First, the court must “identify the function explicitly recited in the claim.” Id. Then the court must “identify the corresponding structure set forth in the written description that performs the particular function set forth in the claim.” Id. at 1369-70. The identified structure must not include “structure from the written description beyond that necessary to perform the claimed function.” Micro Chem., Inc. v. Great Plains Chem. Co., Inc., 194 F.3d 1250, 1258 (Fed. Cir. 1999).

B. Indefiniteness

Defendants ask the Court to hold that two claim limitations that appear frequently in both patents are insolubly ambiguous. (Dkt. No. 301 at 9-10.) This finding would render invalid all the claims of the ‘314 Patent and claims 4-8, 11, 34, and 35 of the ‘652 Patent. (Id.) The two limitations are: (1) that images be displayed in an “unobtrusive manner” and (2) that the display of images must not “distract a user” from the user’s primary interaction with the apparatus. (Id.); ‘652 Patent, Claims 4-8, 11, 34, 35; ‘314 Patent, All Claims. Defendants assert, “[w]hether treated separately or together, these claim limitations fail to define a definite invention at least

1 because whether an image is displayed in an ‘unobtrusive manner’ or ‘does not distract a user’  
2 depends on the subjective opinion of each individual user and on the surrounding environment in  
3 which the image is displayed.” (Dkt. No. 301 at 10.) Therefore, Defendants assert, the Patents do  
4 not tell one of ordinary skill in the art what constitutes displaying an image in an “unobtrusive  
5 manner” and what “does not distract a user.” (Dkt. No. 301 at 10.)

6 Every patent’s specification must “conclude with one or more claims particularly  
7 pointing out and distinctly claiming the subject matter which the applicant regards as his  
8 invention.” 35 U.S.C. § 112 ¶ 2 (2000); see Halliburton Energy Servs., Inc. v. M-1 LLC, 514  
9 F.3d 1244, 1249 (Fed. Cir. 2008). “Because the claims perform the fundamental function of  
10 delineating the scope of the invention, the purpose of the definiteness requirement is to ensure  
11 that the claims delineate the scope of the invention using language that adequately notifies the  
12 public of the patentee’s right to exclude.” Datamize, LLC v. Plumtree Software, Inc., 417 F.3d  
13 1342, 1347 (Fed. Cir. 2005) (citations omitted). “Even if a claim term’s definition can be  
14 reduced to words, the claim is still indefinite if a person of ordinary skill in the art cannot  
15 translate the definition into meaningfully precise claim scope.” Halliburton, 514 F.3d at 1251.  
16 Patent claims with clear boundaries are “essential to promote progress, because [they] enable[]  
17 efficient investment in innovation.” Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535  
18 U.S. 722, 730-31 (2002). This issue is properly raised during the Markman hearing because an  
19 analysis of claim indefiniteness under § 112 ¶ 2 is “inextricably intertwined with claim  
20 construction.” Atmel Corp. v. Information Storage Devices, Inc., 198 F.3d 1374, 1379 (Fed. Cir.  
21 1999); see also Oakley, Inc. v. Sunglass Hut Int’l, 316 F.3d 1331, 1340-41 (Fed. Cir. 2003)  
22 (determination of claim definiteness “requires a construction of the claims according to the  
23 familiar cannons of claim construction.”).

Defendants have a heavy burden to prove indefiniteness. The statutory presumption of patent validity means that “close cases of indefiniteness in litigation involving issued patents are properly resolved in favor of the patentee.” Exxon Research & Eng’g Co. v. United States, 265 F.3d 1371, 1380 (Fed. Cir. 2001). A claim is not indefinite “merely because it poses a difficult issue of claim construction.” Id. at 1375. “Only after a thorough attempt to understand the meaning of a claim has failed to resolve material ambiguities can one conclude that the claim is invalid for indefiniteness. Foremost among the tools of claim construction is of course the claim language itself, but other portions of the intrinsic evidence are clearly relevant, including the patent specification and prosecution history.” All Dental Prodx, LLC v. Advantage Dental Prods., Inc., 309 F.3d 774, 780 (Fed. Cir. 2002).

Using the ordinary tools of claim construction, the Court finds that the terms “in an unobtrusive manner” and “does not distract” a user, whether used together or separately, are insolubly ambiguous. See ‘652 Patent, Claims 4-8, 11, 34, 35; ‘314 Patent, All Claims. The intrinsic record provides no basis for a person of ordinary skill in the art to determine whether a displayed image is displayed in an “unobtrusive manner.” (Id.) The Federal Circuit addressed a similar situation in Datamize, where it held that a claim directed to an electronic kiosk system with an “aesthetically pleasing” user interface was invalid as indefinite because neither the claim language nor the specification provided an “objective standard . . . in order to allow the public to determine the scope” of the term. 417 F.3d at 1350. The Datamize court found that the patentee “offered no objective definition identifying a standard for determining when an interface screen is ‘aesthetically pleasing.’” Id. Likewise, the claims of the ‘652 and ‘314 Patents provide no meaningful definition of the phrase “unobtrusive manner,” because the same image may or may

1 not be considered unobtrusive depending on a variety of factors, such as color, size, and  
2 information displayed. (See Dkt. No. 301 at 14.)

3 Similarly, the limitation that a displayed image “does not distract” a user is indefinite  
4 because whether something distracts a user from his primary interaction depends on the  
5 preferences of the particular user and the circumstances under which any single user interacts  
6 with the display. See Halliburton, 514 F.3d at 1255 (“When a proposed construction requires that  
7 an artisan make a separate infringement determination for every set of circumstances in which  
8 the composition may be used, and such determinations are likely to result in differing outcomes  
9 (sometimes infringing and sometimes not), that construction is likely to be indefinite.”). As  
10 Defendants explain, one user with a higher ability to focus may not be distracted by an image,  
11 while another user with a lesser ability to concentrate may be easily pulled away by the same  
12 image. (Dkt. No. 301 at 17.) “While patentees are allowed to claim their inventions broadly, they  
13 must do so in a way that distinctly identifies the boundaries of their claims.” Halliburton, 514  
14 F.3d at 1253.

15 The Patents’ specification also fails to provide guidance. Plaintiff points to various  
16 passages in the specification that purport to define the terms “unobtrusive manner” and “does not  
17 distract the user.” (Dkt. No. 311 at 7-8.) Despite Plaintiff’s insistence, none of these sections  
18 show one of ordinary skill in the art how to distinguish between displays of content that are  
19 obtrusive/unobtrusive and distracting/non-distracting. Plaintiff points to Column 6, lines 37-51  
20 of the specification of the ‘652 Patent, which discusses an embodiment where “the information is  
21 presented by the attention manager during active periods . . . in an unobtrusive manner that does  
22 not distract the user from the primary interaction (e.g., the information is presented in areas of a  
23 display screen that are not used by displayed information association with the primary  
24

1 interaction).” ‘652 Patent at 6:39-45. During the Markman hearing, Plaintiff focused on the  
2 parenthetical in lines 43-45, arguing that this provided an express definition of the terms.  
3 However, while a patent’s specification may act as a dictionary, a dictionary only works if it is  
4 comprehensible. See Silicon Graphics, Inc. v. ATI Techs., Inc., 607 F.3d 784, 789 (Fed Cir.  
5 2010) (“If the specification reveals a special definition for a claim term, ‘the inventor’s  
6 lexicography governs” (quoting Phillips, 415 F.3d at 1316)). Here there is simply no way that a  
7 person of ordinary skill in the art would know that this phrase, starting with “e.g.,” constitutes an  
8 express definition. ‘652 Patent at 6:39-45.

9       The next passage, which explains that an attention manager “generally” makes use of  
10 “unused capacity,” including both “spatial” and “temporal” dimensions, also provides little  
11 guidance to one of ordinary skill in the art trying to understand the terms. ‘652 Patent at 6:45-  
12 51; see Datamize, 417 F.3d at 1352 (“while the description of an embodiment provides examples  
13 of aesthetic features of screen displays that can be controlled by the authoring system, it does not  
14 explain what selection of these features would be ‘aesthetically pleasing.’”). Neither do examples  
15 of specific embodiments. In Datamize, the patentee provided examples of features that were  
16 “aesthetically pleasing,” such as “some aspect of button styles and sizes, window borders, color  
17 combinations, and type fonts,” but the Federal Circuit held that the term was still indefinite  
18 because “the specification does not explain what factors a person should consider when selecting  
19 a feature to include in the authoring system.” Id. Here, Plaintiff points the Court to an  
20 embodiment that uses the “unused spatial capacity” of the display screen, or is “presented in  
21 areas of a display screen that are not used by displayed information associated with the primary  
22 interaction.” (Dkt. No. 311 at 7); ‘652 Patent at 6:37-51; 2:17-19. As in Datamize, these  
23 descriptions are unhelpful because they do not explain what factors a person should consider  
24

1 when selecting a feature to include. 417 F.3d at 1352. In fact, rather than providing any objective  
2 guidance, the examples cited by Plaintiff simply refer back in general terms to the “wallpaper” or  
3 “screensaver” embodiments. They do not provide a way for a person of ordinary skill in the art to  
4 translate the definition into meaningfully precise claim scope. See Halliburton, 514 F.3d at 1251.

5 The prosecution history also fails to set forth an objective method to determine whether a  
6 displayed item is “unobtrusive” or would “not distract” a user. Plaintiff argues that although the  
7 PTO raised possible indefiniteness issues for other terms, it “never raised any issue with respect  
8 to the ‘unobtrusive manner’ phrase.” (Dkt. No. 311 at 8.) Plaintiff also cites to the prosecution  
9 history of the ‘652 patent, where the PTO linked “display[ing] content data in an unobtrusive  
10 manner” with the “wallpaper embodiment and display area embodiment.” (Dkt. No. 327-1 at  
11 107.) None of this provides guidance as to any “physical characteristics that guide the  
12 determination” of whether a display is unobtrusive or distracting. See Deere & Co. v. Bush Hog,  
13 LLC, No. 2011-1629, -1630, -1631, slip op. at 17 (Fed. Cir. Dec. 4, 2012.) Lastly, Plaintiff cites  
14 to various examples where Defendants have used the term “unobtrusive” in their own patents.  
15 (Id.) However, Defendants point out that most of those patents do not use the term “unobtrusive”  
16 in a claim, and, even if they do, their specifications may contain sufficient guidance. In sum,  
17 Plaintiff fails to show that the extrinsic record provides any clarity regarding the meaning of  
18 these two terms.

19 The limitations “unobtrusive manner” and “does not distract a user” are indefinite  
20 because the patents fail to provide an objective standard by which to define the scope of these  
21 terms. See Datamize, 417 F.3d at 1350. They are also indefinite because the determination of  
22 whether an accused product would meet the claim limitations depends on its usage in changing  
23  
24

circumstances. See Halliburton, 514 F.3d at 1254-55. Therefore, the Court finds that the claims containing these terms are invalid for indefiniteness under 35 U.S.C. § 112 ¶ 2.

C. Terms for Construction

**1. “selectively displaying on the display device . . . an image or images generated from the set of content data”**

The Court adopts the parties’ agreed construction of term 1: “[choose/choosing] and display[ing] one or more “images generated from the set of content data” according to scheduling information. (Dkt. No. 334.)

**2. “images generated from a set of content data”**

| PLAINTIFF’S CONSTRUCTION  | DEFENDANTS’ CONSTRUCTION  |
|---|---|
| Audio and/or visual output that is generated from data within a set of content data | Audio and/or visual output defined by a content provider that is generated from data within a set of related data |

The Court adopts Plaintiff’s proposed construction: “audio and/or visual output that is generated from data without a set of content data.”

The only dispute between the parties with respect to this term is whether the audio and/or visual output must be “defined by the content provider,” as Defendants propose. (Dkt. No. 301 at 21.) Defendants argue that their construction specifies, “consistent with the intrinsic record and the very purpose of the invention, that the audio and/or visual output is defined by the content provider.” (Id.) This proposed construction goes too far. While the abstract of the ‘652 Patent states that the attention manager “affords an opportunity to content providers to disseminate their information,” the Patent nowhere says that the output is “defined” by the content provider. ‘652 Patent, Abstract.

Defendants' proposed construction also fails because it conflicts with the definitions of "image" and "content data" in the specification. (Dkt. No. 300 at 12.) The specification defines "image" as "any sensory stimulus that is produced from the set of content data" and defines "content data" as "data that is used by the attention manager to generate displays." '652 Patent at 6:60-64; 9:51-54. The idea that output must be defined by a content provider does not appear in the specification. "If the specification reveals a special definition for a claim term, 'the inventor's lexicography governs,'" Silicon Graphics, Inc. v. ATI Techs., Inc., 607 F.3d 784, 789 (Fed Cir. 2010) (quoting Phillips, 415 F.3d at 1316.). Therefore, the Court adopts Plaintiff's proposed construction.

**3. "in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus"**

**PLAINTIFF'S CONSTRUCTION**

During a user's primary interaction with the apparatus and unobtrusively such that the images generated from the set of content data are displayed in addition to the display of images resulting from the user's primary interaction

**Alternate Construction: During a user's primary interaction with the apparatus and the information is presented in an area of the display screen not substantially used by displayed information associated with the primary interaction of the user**

**DEFENDANTS' CONSTRUCTION**

As written, this term is inherently subjective and therefore indefinite.

Alternately, this must be limited such that the images are displayed either when the attention manager [or system] detects that the user is not engaged in a primary interaction or as a background of the computer screen.

As explained in Section B, these terms are indefinite. Courts cannot rewrite claims to preserve their validity. Rhine v. Casio, Inc., 183 F.3d 1342, 1345 (Fed Cir. 1999); see also Becton, Dickinson & Co. v. C.R. Bard, Inc., 922 F.2d 792, 799 n.6 (Fed. Cir. 1990) ("Nothing in any precedent permits judicial redrafting of claims."). "While patentees are allowed to claim



1 their inventions broadly, they must do so in a way that distinctly identifies the boundaries of their  
2 claims.” Halliburton, 514 F.3d at 1253.

3 Plaintiff’s argument against a finding of indefiniteness highlights the flaws in these  
4 terms. Plaintiff asserts that the following passage from the specification provides a clear,  
5 objective definition of “unobtrusive manner”:

6 According to another further aspect of the invention, the selective display of an image or  
7 images *occurs while the user is engaged in a primary interaction with the apparatus,*  
8 *which primary interaction can result in the display of an image or images in addition to*  
9 *the image or images generated from the set of content data* (“the wallpaper  
10 embodiment”) (emphasis added in Plaintiff’s brief). ‘652 Patent at 3:25-31; (Dkt. No. 300  
11 at 18-19.)

12 But this purported “clear, objective definition” sheds no light on what “unobtrusive manner”  
13 means. Are all manifestations of the screensaver embodiment considered “unobtrusive”? What  
14 color, shape, or size makes an image more or less “unobtrusive”? Which unused areas of the  
15 display screen are unobtrusive? The “definition” cited by Plaintiff addresses none of these  
16 questions. See Datamize, 417 F.3d at 1351 (“when faced with a purely subjective phrase . . . a  
17 court must determine whether the patent’s specification supplies some standard for measuring  
18 the scope of the phrase.”).

19 As Defendants point out, this purported “clear, objective definition” fails to even mention  
20 the word “unobtrusive.” (Dkt. No. 315 at 12.) Further, the passage states that the primary  
21 interaction “can result” in the display of images, not that it “must result” or even that it “results.”  
22 (Id.) The words “can result” indicate that the primary interaction sometimes, but not always,  
23 results in the display. (Id.) Plaintiff’s argument that the patentee acted as its own lexicographer is  
24 unpersuasive. A comparison with Phillips is illustrative. 415 F.3d at 1325. In Phillips, the  
Federal Circuit relied on passages in the asserted patent’s specification that specifically discussed

1 “baffles” to construe the term “baffles.” *Id.* Here, Plaintiff is unable to point to any such  
2 language discussing a specific meaning for “unobtrusive.”

3 Plaintiff’s proposed construction also incorrectly excludes the screen saver embodiment  
4 described in the Patents. Column 6, lines 45-51 of the ‘652 Patent specification states,  
5 “Generally, then, an attention manager according to the invention makes use of ‘unused  
6 capacity’ of a display device, ‘unused capacity’ being defined broadly to include, for example,  
7 the embodiments mentioned above, i.e., both *temporal* (e.g., the first-described embodiment  
8 above) and *spatial* (e.g., the second-described embodiment above) dimensions” (emphasis  
9 added). ‘652 Patent, 6:45-51. This explanation, coming directly after Plaintiff’s proposed  
10 definition of “unobtrusive,” does not distinguish between the “temporal” embodiment and the  
11 “spatial” embodiment. (Dkt. No. 300 at 18-19.) Plaintiff’s references to the prosecution history  
12 are unpersuasive because, to the extent the PTO identifies “unobtrusive” with the “wallpaper  
13 embodiment,” this conflicts with the language of the specification, which does not distinguish  
14 between the screensaver embodiment and the wallpaper embodiment. See SRAM Corp. v. AD-II  
15 Eng’g, Inc., 465 F.3d 1351, 1359 (Fed. Cir. 2006).

16 Finally, Plaintiff’s last-minute amendment, presented to the Court as an “alternative  
17 compromise construction” that Defendants rejected, still does not solve the indefiniteness  
18 problem. (Dkt. No. 334.) Plaintiff suggests construing the term to mean “during a user’s primary  
19 interaction with the apparatus and **the information is presented in an area of the display**  
20 **screen not substantially used by displayed information associated with the primary**  
21 **interaction of the user**” (emphasis indicates amendment). (*Id.* at 3.) First, this construction  
22 reads out the words “does not distract” from the term, while introducing the word  
23 “substantially.” Second, the proposed construction, specifying that the information must be  
24

presented in an areas “not substantially used” is still indefinite, because it is not supported in the specification and because one of ordinary skill in the art has no way of knowing what “substantial” means in this context. Rather than providing clarification for the Court, Plaintiff’s inability to settle on a construction further undermines its argument that the specification acted as a dictionary regarding this term.

#### 4. “primary interaction”

During the Markman hearing, the parties agreed to adopt the definition of this term in Column 8, lines 19-23 of the ‘652 Patent. Therefore, the Court construes “primary interaction” as “any operation of the computer that occurs to enable or to support the performance of the function or functions that provide the basis for the user’s use of the computer.”

#### 5. “means for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data”

#### PLAINTIFF’S CONSTRUCTION

**Function:** Selectively displaying an image or images generated from the set of content data on the display device in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus

**Structure:** One or more digital computers programmed to identify the next set of content data in the schedule and display the next set of content data in the schedule in an “unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus”

#### DEFENDANTS’ CONSTRUCTION

As set forth above, this term includes a phrase that is indefinite within the recited function; thus this term is indefinite.

**Function:** “selectively displaying on the display device in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data” [as construed herein]

To the extent there is any structure disclosed that could fulfill the recited function, it is:

**Structure:** A conventional digital computer programmed with a screen saver application program, activated by the detection of an idle period, or a wallpaper application program, that “selectively displays . . . image or images generated from the set of content data” [as

construed herein]

As explained in Section B, this term includes a phrase that is indefinite within the recited function; therefore this term is indefinite.

The parties agree that the recited function includes displaying images “in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction.” (Dkt. No. 315 at 15-16.) However, the parties dispute what, if any, structure is disclosed in the specification for performing the function recited in the claim. (Dkt. No. 301 at 29; Dkt. No. 300 at 22-24.) The Federal Circuit has observed that “[i]n a means-plus-function claim in which the disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm.” WMS Gaming, Inc. v. Int’l Game Tech., 184 F.3d 1339, 1349 (Fed. Cir. 1999). “The corresponding structure for a § 112 ¶ 6 claim for a computer-implemented function is the algorithm disclosed in the specification.” Aristocrat Techs. Austl. PTY Ltd. v. Int’l Game. Tech., 521 F.3d 1328, 1333 (Fed. Cir. 2008).

Here, Plaintiff fails to identify anything in the specification that describes the steps the software would perform or the “algorithm” used to implement the recited function for the “means for displaying” term. (Dkt. No. 315 at 16.) While a “description of the function in words may disclose, at least to the satisfaction of one of ordinary skill in the art, enough of an algorithm to provide the necessary structure under § 112 ¶ 6,” the description Plaintiff provides here is insufficient. See Typhoon Touch. Techs., Inc. v. Dell, Inc., 659 F.3d 1376, 1384 (Fed. Cir. 2011). Plaintiff points to Fig. 5A in the specification, which says the digital computer must select the content to be displayed. (Dkt. No. 311 at 14.) Then, Plaintiff explains, “the image or images generated from that set of content data must be displayed ‘in an unobtrusive manner’.” (Id.,

citing step 105 of Fig. 5A). Then, according to Plaintiff, the images must be displayed “during a user’s primary interaction with the apparatus and unobtrusively such that the images generated from the set of content data are displayed in addition to the display of images resulting from the user’s primary interaction.” (*Id.*, quoting ‘652 patent at 3:25-30.) Rather than describing the function, Plaintiff merely parrots the indefinite functional language in the claims and fails to identify any algorithm that is actually capable of accomplishing the function. As Defendants explain, “[s]uch a construction would capture any general purpose computer programmed to perform the recited function regardless of whether it corresponds to any algorithm in the specification.” (Dkt. No. 301 at 29-30.) Therefore, the Court finds claim 4 of the ‘652 Patent and its dependent claims are invalid as indefinite for lacking sufficient disclosure of supporting structure.

**6. “each content provider provides its content data to [a/the] content display system independently of each other content provider”**

| PLAINTIFF’S CONSTRUCTION   | DEFENDANTS’ CONSTRUCTION   |
|--|--|
| No construction needed; in the alternative: each content provider provides its content data to the content display system without being influenced or controlled by any other content provider | Each content provider transmits its content data to [a/the] content display system without being transmitted through, by or under the influence or control of any other content provider |

The Court adopts Plaintiff’s construction and declines to construe this term.

The only dispute regarding this term concerns whether the word “independently” needs to be construed at all. (Dkt. No. 300 at 42; Dkt. No. 301 at 30.) It does not. Defendants explain that their construction clarifies that “a content provider does NOT provide its content data ‘independently’ if one content provider’s data is provided ‘through, by or under the influence or control of any other content provider.’” (Dkt. No. 301 at 30 (emphasis in original).) If a claim

term is non-technical and derives no special meaning from the patent and its prosecution history, the court need not construe it. See U.S. Surgical Corp., 103 F.3d at 1568. That is the case here.

The prosecution history confirms Plaintiff's assertion that the term need not be construed. During the original prosecution the patentee expressly removed the requirement of "direct" transmission from the content provider to the content display system as part of the amendment in which the language of this disputed term was added. (Dkt. No. 300 at 25, citing '314 Patent History, IL\_DEFTS0006293.) As part of this amendment, the "directly to the display device" language was removed from the claims, while the language disputed here was added. (*Id.*) Defendants' proposed construction improperly reintroduces a requirement of "direct" transmission that was expressly removed during prosecution.

**7. "user interface installation instructions for enabling provision of a user interface that allows a person to request the set of content data from the specified information source"**

| PLAINTIFF'S CONSTRUCTION  | DEFENDANTS' CONSTRUCTION  |
|---|---|
| "installation instructions" for enabling provision of an interface that enables a person to request the set of content data from a specific source of information | "instructions" that enable content providers to install a user interface in the content provider's information environment so that users can request a particular set of content data representing the image(s) to be displayed from the specified content provider |

The Court adopts Plaintiff's construction: "'installation instructions' for enabling provision of an interface that enables a person to request the set of content data from a specific source of information."

Defendants ask the Court to require that the user interface be "in the content provider's information environment," as outlined in the specification of the '652 Patent at Col. 16:9-16. (Dkt. No. 301 at 32.) But adopting this construction would import a limitation from a preferred

embodiment in contravention of Federal Circuit precedent. See Phillips, 415 F.3d at 1323 (“[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.”). In fact, the specification of the ‘652 Patent explains that “[a]ny appropriate user interface can be used for enabling a user to directly request a particular set of content data.” ‘652 Patent at 18:60-61. This contravenes Defendants’ construction. Id.

Defendants also attempt to limit the claim by requiring that the user interface permit a user to request “a particular set of content data representing the image(s) to be displayed from the specified content provider.” (Dkt. No. 301 at 32.) Again, Defendants’ attempt to insert a requirement that every content provider take an active role in “defining” or “formulating” the content data or the images generated is an improper attempt to import a limitation from a preferred embodiment. (Dkt. No. 300 at 27.) This language is not supported by the claims and would only serve to add uncertainty about what the claims require.

#### 8. “during operation of an attention manager”

| PLAINTIFF’S CONSTRUCTION  | DEFENDANTS’ CONSTRUCTION  |
|---|---|
| During the operation of a system for engaging at least part of the user’s attention that is not occupied by the user’s primary interaction with the apparatus | During operation of a system that displays images to a user either when the program detects that the user is not engaged in a primary interaction or as a background of the computer screen |

The Court adopts Defendants’ construction: “During operation of a system that displays images to a user either when the program detects that the user is not engaged in a primary interaction or as a background of the computer screen.”

Plaintiff’s construction, relying on the discussion of “attention manager” in the Abstract of the ‘652 Patent, would result in a construction that provides no meaningful boundaries for the



1 term. Contrary to Plaintiff’s assertion, the specification does not define the term “attention  
2 manager”; it simply uses the term as the title of its invention. (Dkt. No. 301 at 33.) The Court  
3 construes the term according to the only description in the specification that gives objective  
4 boundaries to the scope of this limitation: the “screensaver” and “wallpaper” embodiments. (Dkt.  
5 No. 301 at 33.)

6 The prosecution history also confirms that “attention manager” should be construed  
7 according to the screensaver and wallpaper embodiments. During prosecution, the examiner  
8 rejected the ‘652 Patent over U.S. Patent No. 5,572,643 (the “Judson Patent”), which teaches a  
9 method for displaying messages to a computer user in an internet browser while the user is  
10 waiting for the webpage to load. (Dkt. No. 301 at 34, citing JPHS Ex. C1 at  
11 IL\_DEFTS0007928.) In distinguishing its invention from the Judson Patent, applicants argued  
12 that “the instant invention uses a different unused capacity than that used by the method taught  
13 by Judson.” (Id.) Applicants explained that their invention made use of the “unused capacity” of  
14 a display device and of the attention of a person in the vicinity of the display device through two  
15 implementations, the screensaver and the wallpaper embodiments. (Id.) Having relied on the  
16 specification’s description of both the screensaver and wallpaper embodiments to distinguish the  
17 purported invention from prior art, Plaintiff cannot now expand the scope of the invention during  
18 litigation. See CVI/Beta Ventures v. Tura LP, 112 F.3d 1146, 1158 (Fed. Cir. 1997) (“through  
19 statements made during prosecution or reexamination an applicant . . . may commit to a  
20 particular meaning for the patent term, which meaning is then binding in litigation”).

21 The Court reads the claim term “in the context of the entire patent, including the  
22 specification.” Phillips, 415 F.3d at 1313. Defendants’ proposed construction is the only one that  
23  
24



gives objective meaning to the term “attention manager” and is consistent with the specification and the prosecution history.

**9. “means for acquiring a set of content data from a content providing system”**

**PLAINTIFF’S CONSTRUCTION**

**DEFENDANTS’ CONSTRUCTION**

**Function:** acquiring a set of content data from a content providing system

**Function:** acquiring a set of content data from a content providing system

**Structure:** A digital computer capable of communicating with a content providing system via a network and programmed to perform at least the following steps: (1) providing a user with an interface to directly request a particular set of content data, (2) indicating to the content provider the particular set of content data requested by the user, and (3) obtaining the particular set(s) of content data requested by the user at the content display system

**Structure:** A digital computer connected to a content providing system via a network and programmed to perform the steps: (1) providing a user with an interface to directly request a particular set of content data, (2) indicating to the content provider the particular set of content data requested by the user, (3) receiving a set of instructions at the content display system that identify the site from which the set of content data is to be acquiring, (4) downloading the particular set(s) of content data requested by the user at the content display system

The Court adopts Plaintiff’s construction of this means-plus-function term.

The parties agree on the function of this term. (Dkt. No. 300 at 28; Dkt. No. 301 at 36.)

However, the parties’ proposed constructions raise three disputes concerning the corresponding structure: (1) whether the digital computer must be “connected to a content providing system via a network” as an independent limitation; (2) whether the corresponding structure must be programmed for “receiving a set of instructions at the content display system that identify the site from which the set of content data is to be acquired”; and (3) whether the content data must be “downloaded,” rather than simply “obtained.” (Dkt. No. 300 at 29.) The answer to each question is no.

Defendants' proposed requirement that the digital computer be connected to the content providing system "via a network" goes beyond the language of the specification, which explains, "[a]ny appropriate user interface can be used for enabling a user to directly request a particular set of content data." '652 Patent at 18:60-61. Defendants' proposed construction also improperly suggests that a connection must be maintained at all times, while the recited steps only require requesting and obtaining the content data. (Dkt. No. 300 at 29.) As Plaintiff explains, the user interface could be presented to the user before a connection with the content provider is established, but this would not fall within Defendants' proposed construction. (*Id.*) See *Micro Chem.*, 194 F.3d at 1258 ("Nor does the statute permit incorporation of structure from the written description beyond that necessary to perform the claimed function.").

Defendants' proposed construction also improperly includes the step of "receiving a set of instructions at the content display system that identify the site from which the set of content data is to be acquired." (Dkt. No. 300 at 30.) The fact that this step is not necessary to perform the function is demonstrated by its omission from Figure 4, which describes a "method . . . for acquiring and updating sets of content data." '652 Patent at Fig. 4. Defendants assert that "acquisition instructions 331" are necessary to perform the claimed function." (Dkt. No. 301 at 36.) But the specification teaches that "acquisition instructions 331" are obtained after a set of content data has been acquired by the content display system. '652 Patent at 20:62-65. Because it is not necessary to perform the recited function, Defendants' step (3) will not be incorporated in the structure for this term.

Finally, Defendants' proposed use of the term "downloading" rather than "obtaining" is unnecessary and goes against the usage in the specification. (Dkt. No. 300 at 30.) If a claim term is non-technical and derives no special meaning from the patent and its prosecution history, the

1 court need not construe it. See U.S. Surgical Corp., 103 F.3d at 1568. The specification provides  
 2 no reason to replace these easily understandable words with “downloading,” a term that does not  
 3 appear in the specification. (Dkt. No. 300 at 31.) Defendants object that “a jury may interpret  
 4 ‘obtaining’ to include an embodiment where content data was acquired through local sources,”  
 5 which was expressly disclaimed. (Dkt. No. 315 at 21.) Defendants provide no evidence that the  
 6 word “downloading” is any less susceptible to misinterpretation than the word “obtaining.”  
 7 Plaintiff’s construction is more reasonable.

#### 8 **10. “content provider”**

| 9 <b>PLAINTIFF’S CONSTRUCTION</b>   | 10 <b>DEFENDANTS’ CONSTRUCTION</b>                              |
|---|---|
| 11 No construction necessary; in the alternative: a system that provides one or more “sets of content data” | 12 An entity that formulates one or more “sets of content data” |

13 The Court finds that no construction is necessary of this term because it is non-technical  
 14 and has no special meaning in the context of the patent. See U.S. Surgical Corp. v. Ethicon, Inc.,  
 15 103 F.3d 1554, 1568 (Fed. Cir. 1997).

16 Defendants’ proposed construction inappropriately limits the claim term to require that  
 17 the content provider “formulate” the content, rather than simply “provide” it. (Dkt. No. 300 at  
 18 31, Dkt. No. 301 at 38.) See Phillips, 415 F.3d at 1323 (“[A]lthough the specification often  
 19 describes very specific embodiments of the invention, we have repeatedly warned against  
 20 confining the claims to those embodiments.) While Defendants are able to point to a few  
 21 instances where the word “formulate” is used, it is not used universally. Cf. ‘314 Patent,  
 22 Abstract; ‘314 Patent 31:48-49, 31:52-53, 31:58-59. In fact, while the Abstract of the ‘314 Patent  
 23 says that “[e]ach set of content data is formulated by a content provider,” it nowhere says that  
 24

every content provider must “formulate,” rather than “provide,” the sets of content data. ‘314 Patent Abstract.

**11. “content data scheduling instructions for providing temporal constraints on the display of the image or images generated from the set of content data”**

**PLAINTIFF’S CONSTRUCTION**

**DEFENDANTS’ CONSTRUCTION**

“instructions” that affect the duration, order, timing, and/or frequency of the display of the “image or images generated from the set of content data”

instructions that can be tailored by a content provider that specify the time(s) at which image(s) generated from a set of content data may be displayed

The Court adopts Plaintiff’s construction: “‘instructions’ that affect the duration, order, timing, and/or frequency of the display of the ‘image or images generated from the set of content data.’”

The parties have two disagreements regarding this term: (1) whether “temporal” is limited to “timing,” or also includes duration, order and frequency; and (2) whether the limitation requires that all content data scheduling instructions must always be capable of being “tailored by a content provider.” (Dkt. No. 300 at 33; Dkt. No. 301 at 39.) Plaintiff’s construction is the more reasonable one.

The specification clarifies that “content data scheduling instructions for providing temporal constraints” includes not only timing, but also duration, order, and frequency. (Dkt. No. 300 at 33.) In relevant part, specification states:

The content data scheduling instructions can specify, for example, the duration of time that the image or images generated from a set of content data can be displayed, an order in which the images generated from a plurality of sets of content data are displayed, a time or times at which the image or images generated from a set of content data can or cannot be displayed, and/or constraint on the number of times that the image or images generated from a set of content data can be displayed. ‘652 Patent at 4:31-55.

Some confusion results because a prior sentence, lines 4:37-39, discusses “content data scheduling instructions for providing temporal constraints,” while the later section discusses “content data scheduling instructions.” ‘652 Patent at 4:47-55. However, the context of the specification shows that the use of “temporal” in Column 4, line 38, was not meant to limit the term “content data scheduling instructions” to only what the specification refers to as “timing instructions”—the third example of the specification’s explanation of “content data scheduling instructions” at Column 4, lines 47-55. *Id.* Defendants’ proposed construction is too narrow because it would exclude other types of content data scheduling instructions expressly taught by the specification, including duration instructions, sequencing instructions, and saturation instructions. *See* ‘652 Patent at 4:47-55; 16:65-17:28.

Defendants’ proposal to limit this term to instructions that “can be tailored by a content provider” also incorrectly imports a characteristic from a certain embodiment into the claim. *See Phillips*, 415 F.3d at 1323. The plain language of this limitation does not require that all content data scheduling instructions must always be capable of being “tailored by a content provider.” (Dkt. No. 311 at 21.) While the specification discusses an embodiment where tailoring occurs before the instructions are sent to the content display system, nowhere does it state that the instructions must always be tailored. *See* ‘652 Patent at 17:49-57; (Dkt. No. 300 at 34-35). Plaintiff’s proposed construction, which tracks the claim language while clarifying the meaning of “temporal” according to the specification, is the better construction.

**12. “content data update instructions for enabling acquisition of an updated set of content data from an information source that corresponds to a previously acquired set of content data”**

| PLAINTIFF’S CONSTRUCTION   | DEFENDANTS’ CONSTRUCTION  |
|--|---|
| “instructions” that specify when to obtain an updated version of a set of content data and the | “instructions” that can be tailored by the content provider when to obtain an updated |

|   |  |   |
|---|--|---|
| 1 | location from which to obtain such updated version | version of a previously acquired set of content data and the location from which to obtain such updated version |
| 2 |  |   |

3 The Court adopts Plaintiff's construction: "'instructions' that specify when to obtain an  
4 updated version of a set of content data and the location from which to obtain such updated  
5 version."

6 The parties' only dispute with respect to this term is whether the claimed instructions are  
7 limited to those that "can be tailored by the content provider." (Dkt. No. 300 at 35; Dkt. No. 301  
8 at 42.) For the same reasons discussed in term 11 with respect to content data scheduling  
9 instructions, this additional limitation is improper. In opposition, Defendants cite to the summary  
10 of the invention, which states that "the attention manager allows content providers to tailor  
11 particular aspects of the attention manager as desired by the content provider, such as the  
12 acquisition of updated sets of the content provider's content data (E.g., the frequency of such  
13 updates)." '652 Patent at 5:39-45. Defendants also cite to a sentence in the summary that says  
14 that instructions "can be tailored as necessary or desirable by a content provider." (Dkt. No. 301  
15 at 42); '652 Patent at 3:3-8. But the summary's use of the word "can" is instructive. *Id.* As with  
16 content data scheduling instructions, the specification nowhere says that the instructions "must"  
17 be tailored. Plaintiff's construction is therefore more reasonable.

18  
19 **13. "content display system scheduling instructions for scheduling the display of the  
image or images on the display device"**

|    |  |  |
|----|--|--|
| 20 | <b>PLAINTIFF'S CONSTRUCTION</b>  | <b>DEFENDANTS' CONSTRUCTION</b>  |
| 21 | "instructions" that implement a display schedule by determining which image or             | "instructions" that implement a display schedule for a particular content display system |
| 22 | images generated from the "sets of content data" will be displayed and mediating conflicts | by determining the display order and display duration for image(s) generated from each   |
| 23 | between the display requirements of multiple   | available set of content data  |
| 24 | "sets of content data"   |  |

1  
2 The Court adopts Plaintiff's construction: "'instructions' that implement a display  
3 schedule by determining which image or images generated from the 'sets of content data' will be  
4 displayed and mediating conflicts between the display requirements of multiple 'sets of content  
5 data.'"

6 Only Plaintiff's construction encompasses all types of content display system scheduling  
7 instructions discussed in the specification, without requiring any particular type. See '652 Patent  
8 at 10:43-11:10; 20:37-42; 26:52-57. Defendants' construction highlights one type of content  
9 display system scheduling instructions (display order and duration), but fails to mention that the  
10 specification teaches that these instructions may also determine whether images generated from  
11 certain sets of content data will be displayed at all. Id.; (Dkt. No. 300 at 36). For example, in  
12 Column 26, lines 52-57, the specification teaches that "[t]he content display system scheduling  
13 instructions can include instructions that evaluate a probability function each time that a set of  
14 content data in the schedule is presented for display, and either display or not display the set of  
15 content data dependent upon the evaluation of the probability function. '652 Patent at 26:52-57.

16 Defendants' proposed construction is incorrect because it excludes these types of content  
17 display system scheduling instructions. See Adams Respiratory Therapeutics, Inc. v. Perrigo Co.,  
18 616 F.3d 1283, 1290 (Fed. Cir. 2010) (A claim construction that excludes the preferred  
19 embodiment is rarely, if ever, correct and would require highly persuasive evidentiary support.").  
20 Rather than improperly injecting a limitation into the construction, as Defendants charge, the  
21 statement that the instructions "mediat[e] conflicts between the display requirements of multiple  
22 'sets of content data'" simply construes the term in accordance with the specification. (Dkt. No.  
23 315 at 24); see '652 Patent at 10:43-11:10.  
24

1 **14. “instructions”**

2 **PLAINTIFF’S CONSTRUCTION**

2 **DEFENDANTS’ CONSTRUCTION**

3 Either (a) data related to the accomplishment  
4 of a function and/or (b) a statement or  
5 expression that can be interpreted by a  
computer that specifies a function to be  
performed by a system

A statement in a programming language that  
specifies a function to be performed by a  
system

6 The Court adopts Defendants’ construction: “a statement in a programming language that  
7 specifies a function to be performed by a system.

8 Plaintiff’s proposed construction asks the Court to adopt a broad reading that expands the  
9 scope of the term “instructions” beyond its plain and ordinary meaning to also “include data  
10 related to the accomplishment of a function.” (Dkt. No. 300 at 37-38.) Plaintiff’s construction  
11 would go even further that Plaintiff explains, classifying data alone as “instructions” if it is  
12 “related to the accomplishment of a function.” (*Id.*) This is a step too far.

13 The intrinsic evidence does not support the conclusion that an “instruction” is “data.” For  
14 example, the text of the specification explicitly recognizes that “instructions” and “data” are  
15 different things because functional components can be represented by one or the other. *See* ‘652  
16 Patent at 14:53-54 (“Each of the functional components are represented by a set of instructions  
17 and/or data.” (emphasis added)). If “data” is a type of “instructions,” then the phrase  
18 “instructions and/or data” would not make sense. *Id.*; (Dkt. No. 301 at 44). The specification  
19 acknowledges that “sets of instructions may include, if appropriate, data related to  
20 accomplishment of the functions associated with the set of instructions.” ‘652 Patent at 14:55-57.  
21 In other words, instructions might include data, but instructions cannot be data alone. (Dkt. No.  
22 301 at 44.) This conclusion is confirmed by Plaintiff’s citations to the specification, *see* ‘652  
23  
24



Patent at Fig. 3A, 14:49-65, which state that instructions “may include” data, but do not say that “data” is “instructions.” (Dkt. No. 300 at 38.)

Contrary to Plaintiff’s assertion, the prosecution history of the ‘314 Patent also does not support its proposed construction. Plaintiff cites a portion of the prosecution history of the ‘314 Patent where the examiner explained that the Farber Patent teaches “the respective content provider may provide scheduling instructions tailored to the set of content data since the providing [sic] may send information (new information is an instruction to display new information) at the provider’s control to the client, thus controlling the duration, sequencing, and timing of the images displayed . . . .” ‘314 Patent History, 2/14/2003 Office Action at 6 (IL\_DEFTS0006109). But this statement, made in a parenthetical and discussing a different patent, nowhere says that information alone can constitute an “instruction.” *Id.*

**15. “means for displaying one or more control options with the display device while the means for selectively displaying is operating”**

**PLAINTIFF’S CONSTRUCTION**

**Function:** displaying one or more control options with the display device while the means for selectively displaying is operating

**Structure:** One or more digital computers programmed to provide a dialog box that includes a list of one or more of the following control options (1) terminate the operation of the attention manager, (2) begin display of the next scheduled set of content data, (3) begin display of the previous scheduled set of content data, (4) remove a set of content data from the display schedule, (5) prevent a set of content data from being displayed until it has been updated, (6) modify the display schedule in response to a user’s identified satisfaction with a set of content data, (7) establish a link with an information source, (8) provide an overview of all the content data available for display by

**DEFENDANTS’ CONSTRUCTION**

**Function:** displaying one or more control options with the display device while the means for selectively displaying is operating

**Structure:** One of more digital computers programmed to provide a dialog box that includes a list of one or more of the following control options; perform at least one of steps 501 (Want to display the next set of content data in the schedule?), 502 (Want to display the previous set of content data in the schedule?), 503 (Want to remove the current set of content data from the schedule?), 504 (Want to prevent display of the current set of content data until that set of content data has been updated?), and 505 (Want to specify a satisfaction level for the current set of content data?), and structural equivalents.

the attention manager, (9) maintain display of the current set of content data, or (10) remove the control option interface and structural equivalents.

The Court adopts Plaintiff's construction of this means-plus-function term.

The parties agree that this claim limitation is written in means-plus-function format and therefore invokes 35 U.S.C. § 112 ¶ 6, requiring a determination of the limitation's function and then identifying the corresponding structure in the patent's written description that performs that function. (Dkt. No. 300 at 40-41; Dkt. No. 301 at 45.) The parties also agree that the function of this limitation is "displaying one or more control options with the display device while the means for selectively displaying is operating." (*Id.*) The parties even agree that the structure that performs this function is "one or more digital computers programmed to provide a dialog box that includes a list of . . . control options." (*Id.*) The only disagreement is over what should be included in the list of control options. (*Id.*)

Of the two, Plaintiff's proposed list finds more support in the specification. Defendants derive their list of control options solely from steps 501-505 of Figure 5B. '652 Patent at Fig. 5B. But the Federal Circuit has held that when a specification discloses multiple structures that may correspond to the function of a means-plus-function limitation, the limitation is properly construed as covering all such structures and their equivalents. *See Micro Chem.*, 194F.3d at 1258-59. "The specification can express the algorithm in any understandable terms including as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure." *Noah Sys., Inc. v. Intuit, Inc.*, 675 F.3d 1302 (Fed. Cir. 2012) (citations omitted).

Plaintiff points to five other control options (options 1 and 7-10), all of which are expressly disclosed in the specification. For example, the specification expressly identifies option 1 (terminate the operation of the attention manager), stating, “One control option that can be used with an attention manager according to the invention enables the user to directly terminate operation of the attention manager.” ‘652 Patent at 25:37-40. It expressly describes option 7 (establishing a link with an information source), stating, “Still another control option that can be used with an attention manager according to the invention enables the user to establish a link with another information source.” ‘652 Patent at 27:16-18. It expressly describes option 8 (providing an overview of all content data available for display by the attention manager), stating, “Another control option that can be used with an attention manager according to the invention enables the user to obtain an overview of all of the content data available for display by the attention manager.” ‘652 Patent at 27:64-67. It expressly describes option 9 (maintaining display of the current set of content data), stating, “Still another control option that can be used with an attention manager according to the invention enables the user to maintain display of the currently displayed set of content data 350 until such display is terminated by the user.” ‘652 Patent at 28:10-13. It expressly describes option 10 (removing the control option interface), stating, “Selection of the ‘cancel’ option 602e causes the dialog box 601 to be removed from the screen 600.” ‘652 Patent at 28:21-28. Each of these descriptions explicitly describes control options in an unambiguous manner.

Defendants argue that these statements in the specification are “generic statement[s]” that “do[] not expand the corresponding structure.” (Dkt. No. 301 at 46); see Atmel Corp. v. Info. Storage Devices, Inc., 997 F. Supp. 1210, 1215 (N.D. Cal. 1998) (“A specification that merely mentions the possibility of alternative structures without specifically identifying them is not

sufficient to expand the scope of the claim beyond the example used.”). But the specification here does not “merely mention[]” the structures; it explicitly identifies them. (See Dkt. No. 300 at 43.) The Federal Circuit has no requirement that all control options be described together in one flowchart. Therefore, Plaintiff’s proposed construction is more reasonable.

### Conclusion

The Court finds that the terms “unobtrusive manner” and “does not distract a user” are indefinite, and that the claims containing these terms are therefore invalid under 35 U.S.C. § 112 ¶ 2. The Court adopts Plaintiff’s proposed construction of terms 1, 2, 6, 7, 9, 10, 11, 12, 13, and 15. The Court adopts Defendants’ proposed construction of terms 3, 5, 8, and 14.

The clerk is ordered to provide copies of this order to all counsel.

Dated this 19th day of December, 2012.



Marsha J. Pechman  
United States District Judge

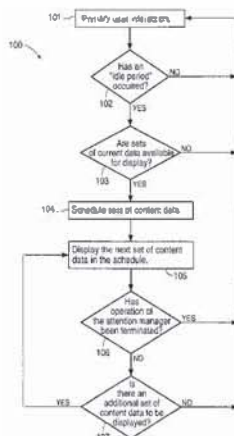
US006034652A

**United States Patent** [19][11] **Patent Number:** **6,034,652****Freiberger et al.**[45] **Date of Patent:** **\*Mar. 7, 2000**[54] **ATTENTION MANAGER FOR OCCUPYING THE PERIPHERAL ATTENTION OF A PERSON IN THE VICINITY OF A DISPLAY DEVICE****FOREIGN PATENT DOCUMENTS**WO 93/19427 9/1993 WIPO.  
WO 96/30864 10/1996 WIPO.[75] **Inventors:** Paul A. Freiberger, San Mateo, Calif.; Golan Levin, Staten Island, N.Y.; David P. Reed, Atherton, Calif.; Marc E. Davis, San Francisco, Calif.; Neal A. Bhadkamkar; Philippe P. Piernot, both of Palo Alto, Calif.; Todd A. Agulnick, San Francisco, Calif.; Sally N. Rosenthal, Palo Alto, Calif.; Giles N. Goodhead, Los Angeles, Calif.**OTHER PUBLICATIONS**Gomes, Lee, "Upstart's Internet 'TV' Has Microsoft Tuned In", *Wall Street Journal*, Aug. 1996.Joan E. Rigdon, "Screen Savers Go Beyond Fish, Flying Toasters," *Wall Street Journal*, Feb. 13, 1996.Staff Reporter, "PointCast Inc. Is Testing New Screen-Saver Product," *Wall Street Journal*, May 1996.[73] **Assignee:** Interval Research Corporation, Palo Alto, Calif.[\*] **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).*Primary Examiner*—Jeffery Brier*Attorney, Agent, or Firm*—David R. Graham[57] **ABSTRACT**

An attention manager presents information to a person in the vicinity of a display device in a manner that engages at least the peripheral attention of the person. The information is embodied by one or more sets of content data (e.g., video or audio data). Each set of content data is formulated by a content provider and made available for use by content display systems. Upon appropriate activation, each content display system displays images corresponding to the sets of content data in accordance with predetermined scheduling information. The attention manager makes use of "unused capacity" of the display device and the person's attention, providing information to the person that the person might not otherwise expend adequate energy to obtain. The attention manager also affords an opportunity to content providers to disseminate their information to people that are interested in receiving such information, enabling the content providers to provide better directed information dissemination, as well as providing access to the previously unused attention capacity of those interested people.

[21] **Appl. No.:** 08/620,641[22] **Filed:** Mar. 22, 1996[51] **Int. Cl.<sup>7</sup>** ..... G09G 5/12; G09G 5/14; G06F 15/16[52] **U.S. Cl.** ..... 345/2; 345/115; 709/218[58] **Field of Search** ..... 345/2, 115, 116, 345/302, 326; 707/10, 104, 501; 395/200.47, 200.48, 200.49; 709/217, 218, 219[56] **References Cited****U.S. PATENT DOCUMENTS**

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**18 Claims, 8 Drawing Sheets**

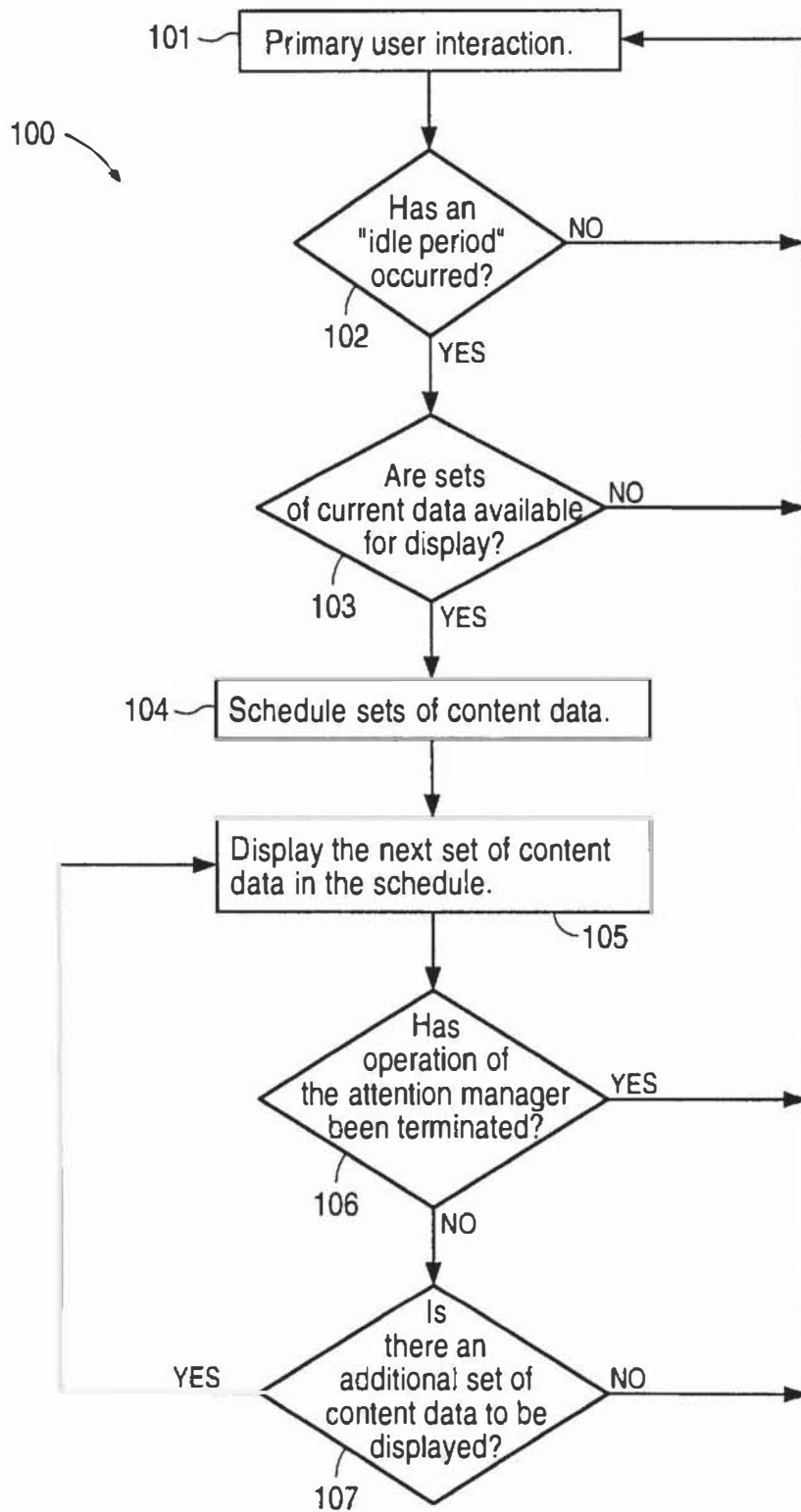
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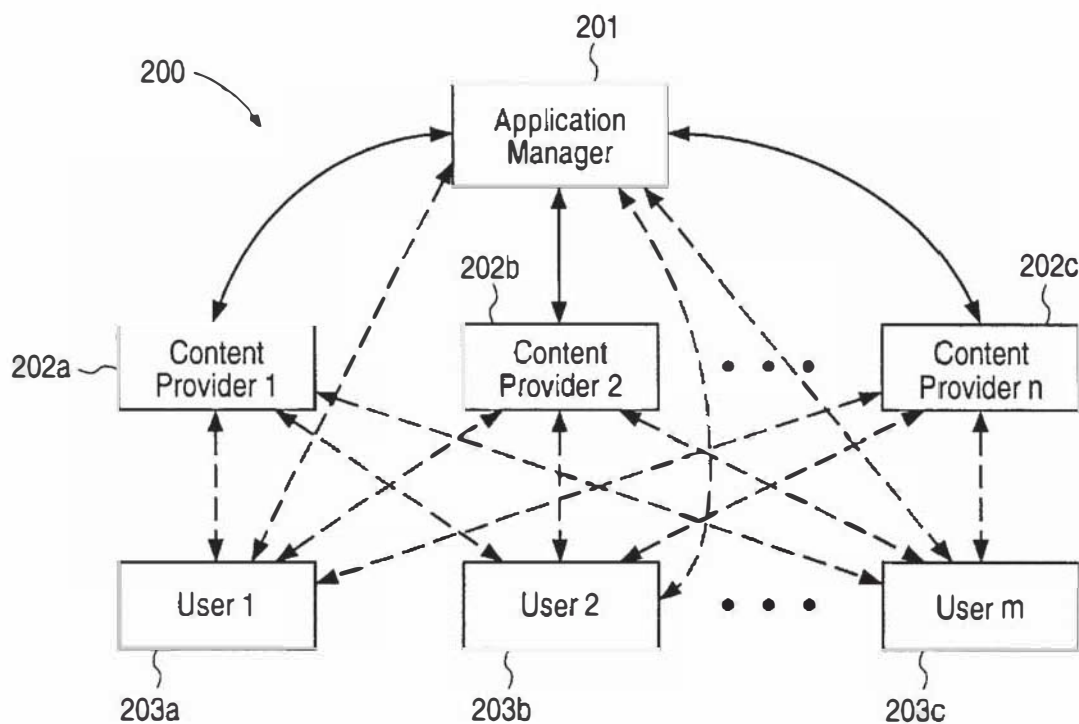
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**FIG. 1**



**FIG. 2**



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|     |                                       |  |       |
|-----|---------------------------------------|--|-------|
| 310 | Application Instructions              | Operating instructions                                 | ~ 311 |
|     |                                       | Current display system scheduling instructions         | ~ 312 |
|     |                                       | Installation instructions                              | ~ 313 |
| 320 | Control Instructions                  | Display instructions (all supported displays, generic) | ~ 321 |
|     |                                       | Content data scheduling instructions (generic)         | ~ 322 |
| 330 | Content Data Acquisition Instructions | Acquisition instructions (generic)                     | ~ 331 |
|     |                                       | Content data update instructions (generic)             | ~ 332 |
|     |                                       | User interface installation instructions               | ~ 333 |
| 340 | Audit Instructions                    | Audit instructions                                     | ~ 340 |

**FIG. 3A**

|     |                                       |  |       |
|-----|---------------------------------------|--|-------|
| 350 | Content Data                          | Content data (multiple?)                                   | ~ 350 |
| 320 | Control Instructions                  | Display instructions (supported displays, tailored?)       | ~ 321 |
|     |                                       | Content data scheduling instructions (tailored, multiple?) | ~ 322 |
| 330 | Content Data Acquisition Instructions | Acquisition instructions (tailored, multiple?)             | ~ 331 |
|     |                                       | Content data update instructions (tailored, multiple?)     | ~ 332 |
|     |                                       | User interface installation instructions                   | ~ 333 |
| 310 | Application Instructions              | Operating instructions                                     | ~ 311 |
|     |                                       | Content display system scheduling instructions             | ~ 312 |
|     |                                       | Installation instructions                                  | ~ 313 |

**FIG. 3B**

|     |                                       |  |       |
|-----|---------------------------------------|--|-------|
| 310 | Application Instructions              | Operating instructions                                     | ~ 311 |
|     |                                       | Current display system scheduling instructions             | ~ 312 |
|     |                                       | Installation instructions                                  | ~ 313 |
| 320 | Control Instructions                  | Display instructions (specific display(s), tailored?)      | ~ 321 |
|     |                                       | Content data scheduling instructions (tailored, multiple?) | ~ 322 |
| 330 | Content Data Acquisition Instructions | Acquisition instructions (tailored, multiple?)             | ~ 331 |
|     |                                       | Content data update instructions (tailored, multiple?)     | ~ 332 |
| 350 | Content Data                          | Content data (multiple?)                                   | ~ 350 |
| 340 | Audit Instructions                    | Audit instructions   | ~ 340 |

**FIG. 3C**



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FIG. 5A

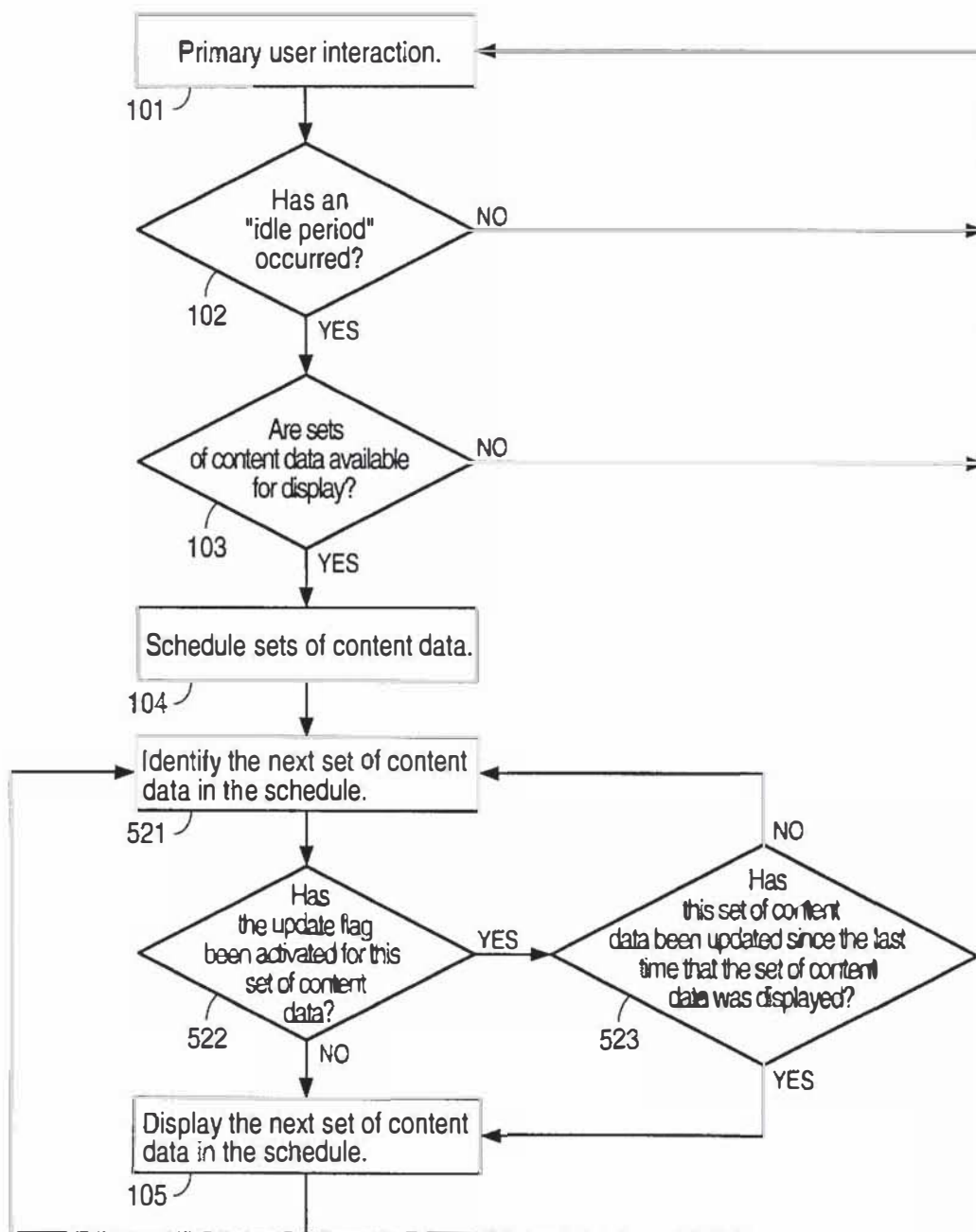
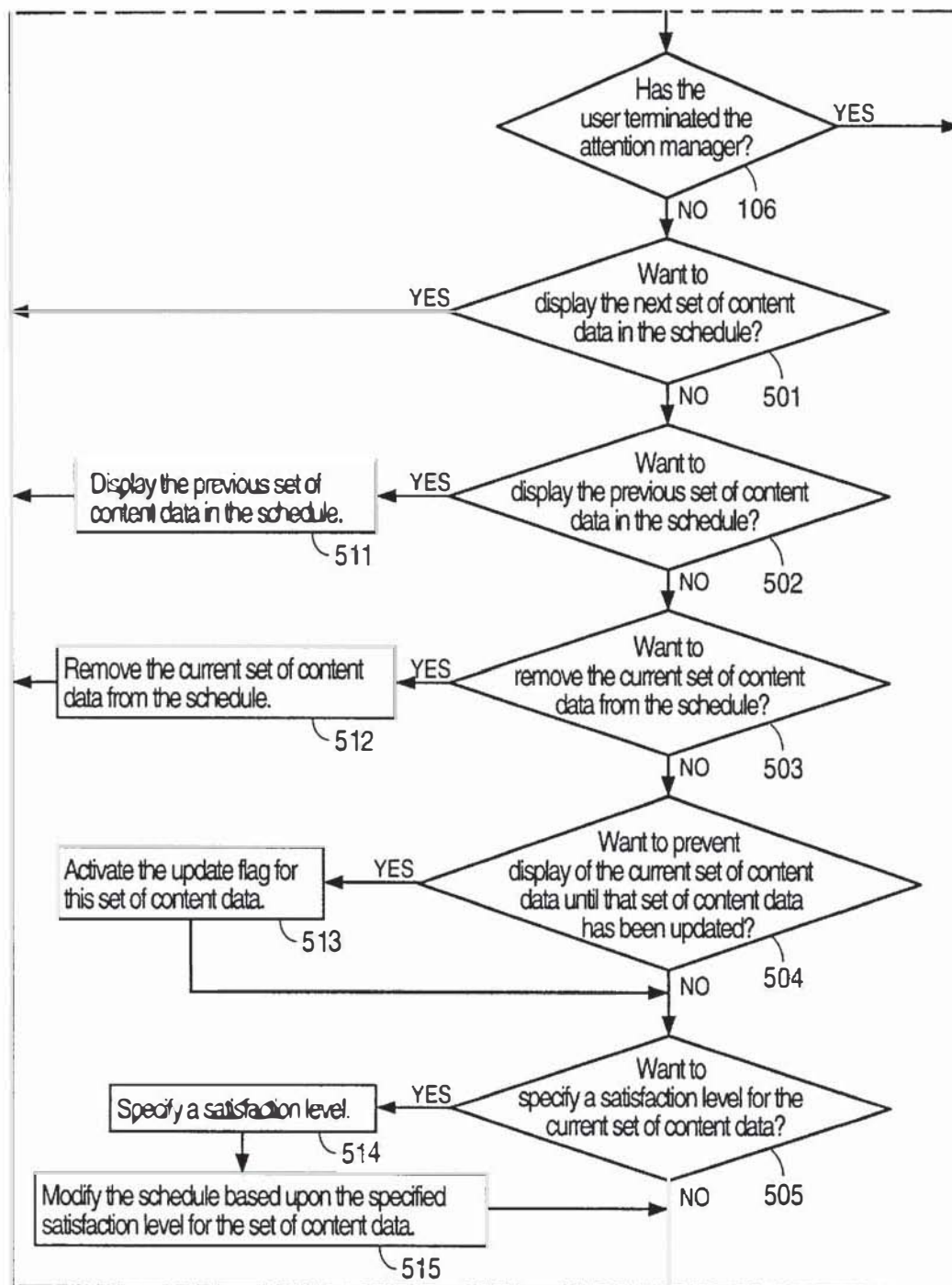


FIG. 5B



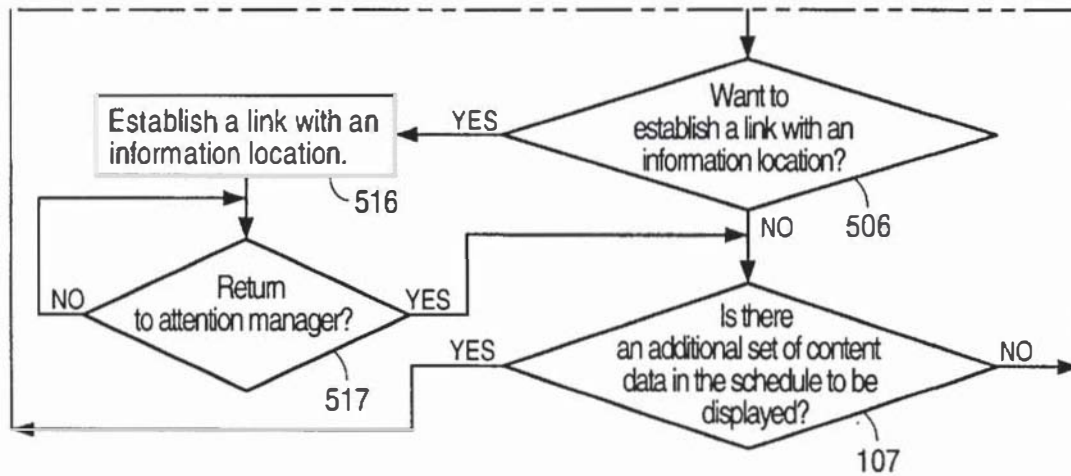


FIG. 5C

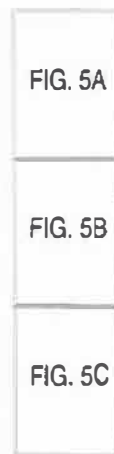


FIG. 5

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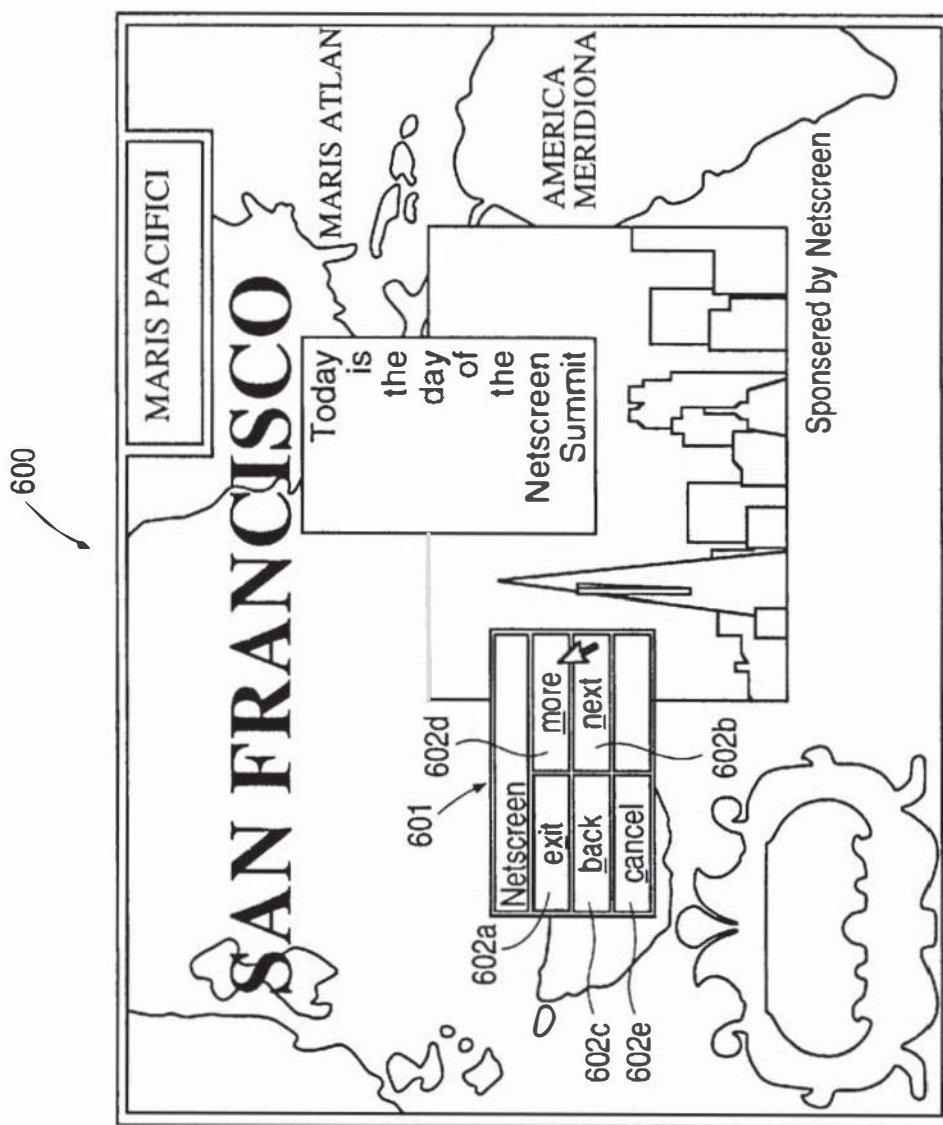


FIG. 6



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# ATTENTION MANAGER FOR OCCUPYING THE PERIPHERAL ATTENTION OF A PERSON IN THE VICINITY OF A DISPLAY DEVICE

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

This invention relates to the engagement of the peripheral attention of a person in the vicinity of a display device such as the display monitor of a computer.

### 2. Related Art

Information providers of all sorts have an interest in presenting their information to information consumers and, in particular, to information consumers who may, or do, have an interest in the particular information provided by the particular information provider. At the same time, information consumers have an interest in accessing a wide variety of information and, in particular, information in which the information consumer may, or does, have an interest. Given the extent to which computers now permeate society, and particularly in view of the escalation of networking of those computers in various ways, there is increasing recognition of the capability of using computers, and, in particular, computers (and other devices) that are interconnected in a network, as an information dissemination tool that can satisfy the interests of both information providers and information consumers.

For example, information providers have used public computer networks (e.g., the Internet) and private computer networks (e.g., commercial online services such as America Online, Prodigy and CompuServe) to disseminate their information. This information can be displayed to a computer user having access to the network directly in response to a request from the user or indirectly (i.e., without request by the user) as a result of another action taken by the user. While these methods of information dissemination and acquisition can be effective, they do not exhaust the possibilities.

In a different vein, historically, computers have frequently included screen saving mechanisms ("screen savers") intended to prevent the phosphors of a computer display screen from burning out when the same image remains on the screen for a long period of time, such as might occur during a long period of inactivity while the computer is operating. As computer display screen technology has progressed, the use of screen savers to preserve the display screen has become increasingly unnecessary. However, the use of screen savers has continued--even proliferated--likely due to the aesthetic or entertainment value provided by the imagery of many screen savers. Further, the use of "wallpaper" (i.e., a pattern generated in the background portions on a computer display screen) in computer display screens has also arisen, largely one would suspect because of the aesthetic or entertainment value of the wallpaper imagery. While the use of screen savers and wallpaper with computer displays appeals to many users because of the imagery they present to the user, screen savers and wallpaper have not heretofore been used as a means to convey information from information providers to computer users. Further, screen savers and wallpaper have previously been implemented as relatively simple, self-contained computer application programs that are not typically integrated with other application programs or other aspects of computer operation. In particular, screen saver and wallpaper application programs have not been constructed to enable retrieval of display content from a remote location via a computer network.

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## SUMMARY OF THE INVENTION

An attention manager according to the invention presents information to a person in the vicinity of a display device in a manner that engages the peripheral attention of the person. Often, the display device is part of a broader apparatus (e.g., the display device of a computer). Generally, the attention manager makes use of "unused capacity" of the display device. For example, the information can be presented to the person while the apparatus (e.g., computer) is operating, but during inactive periods (i.e., when a user is not engaged in an intensive interaction with the apparatus). Or, the information can be presented to the person during active periods (i.e., when a user is engaged in an intensive interaction with the apparatus), but in an unobtrusive manner that does not distract the user from the primary interaction with the apparatus (e.g., the information is presented in areas of a display screen that are not used by displayed information associated with the primary interaction with the apparatus).

The information is embodied as one or more sets of content data. The sets of content data represent sensory data; typically, the sensory data is either video or audio data. Each set of content data is formulated by a content provider and made available for use by an attention manager according to the invention. Each content providing system can provide more than one set of content data. The content providing systems provide user interface tools that enable a particular set of content data to be requested. Once one or more sets of content data has been acquired, a content display system integrates scheduling information for all sets of content data to produce a schedule according to which an image or images corresponding to the sets of content data are displayed on a display device associated with the content display system.

A set or sets of instructions for enabling a display device to selectively display an image or images generated from a set of content data are also made available for use by the content display systems. Typically, the instructions enable images generated from content data to be displayed automatically, without user intervention, in a predetermined manner, thereby enhancing the capability of the invention to occupy the user's peripheral attention. Further, the attention manager can be implemented so that the instructions are automatically acquired (or updated, if necessary) each time a user requests acquisition of a set of content data, thereby making acquisition of the instructions transparent to the user of the attention manager and thus increasing the ease of use for the user. The instructions can include application instructions, control instructions and content data acquisition instructions. The application instructions can include operating instructions for beginning, managing, and terminating operation of the attention manager on a content display system, content display system scheduling instructions for scheduling the display of content data on a content display system, and installation instructions for installing the operating instructions and content display system scheduling instructions on a content display system. The control instructions can include display instructions for enabling generation of images from the content data on a particular type of display device or from a particular type of content data, and content data scheduling instructions for enabling temporal control of the display of the images generated from a set or sets of content data. The content data acquisition instructions can include acquisition instructions for enabling the acquisition of a set of content data, content data update instructions for enabling update of a previously acquired set of content data, and user interface installation instructions



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for enabling provision of a user interface that allows a person to request a set of content data from a content providing system. Each of the application, control and content data acquisition instructions could be acquired from a content provider, or any one or all of the sets of instructions could be acquired from an application manager that provides generic sets of instructions that can be tailored as necessary or desirable by a content provider. Additionally, audit instructions can be made available that enable monitoring of usage of the attention manager.

According to one aspect of the invention, an attention manager engages the peripheral attention of a person in the vicinity of a display device of an apparatus by acquiring one or more sets of content data from a content providing system and selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data. According to a further aspect of the invention, the selective display of the image or images begins automatically after detection of an idle period of predetermined duration (the "screen saver embodiment"). This aspect can be implemented, for example, using the screen saver API (application program interface) that is part of many operating systems. According to another further aspect of the invention, the selective display of an image or images occurs while the user is engaged in a primary interaction with the apparatus, which primary interaction can result in the display of an image or images in addition to the image or images generated from the set of content data (the "wallpaper embodiment"). If multitasking is allowed by the apparatus (e.g., by the computer operating system) with which the attention manager is used, the attention manager can be implemented so that, when operation of the attention manager is terminated, the user is returned to the state of the primary interaction that existed when operation of the attention manager began. The attention manager can also be implemented so that, during operation of the attention manager, the user is presented with a number of options regarding further use of the attention manager. In particular, one of the options can allow additional information to be obtained that is related to the set of content data for which an image is being displayed. Where the attention manager is implemented as part of a network, this option can enable information to be obtained from a remote information source via the network. Another option that can be implemented allows a user to specify a satisfaction level for a set of content data from which an image or images is being displayed, thereby affecting the frequency with which that set of content data is used by the attention manager in the future.

According to another aspect of the invention, an attention manager that engages the peripheral attention of a person in the vicinity of a display device includes a content display system associated with the display device, a mechanism that can communicate with the content display system via a first communications mechanism to provide to the content display system a set of instructions for enabling the display device to selectively display content data, and a content providing system that can communicate with the content display device via a second communications mechanism to provide a set of content data to the content display system. The content display system uses the provided set of instructions to selectively display on the display device an image or images generated from the provided content data. The attention manager according to this aspect of the invention can further include an application management system that

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can communicate via a third communications mechanism to provide to either the content providing system or the content display system one or more sets of instructions for enabling a display device to selectively display an image or images generated from a set of content data. In the former case, the content providing system can, in turn, communicate with the content display system to provide the one or more sets of instructions. The attention manager according to this aspect of the invention can be implemented, for example, using existing computer networks of information sources, such as the Internet (in particular, the World Wide Web) or commercial online services, advantageously making use of pre-existing hardware and software for enabling communication over those networks. Typically, though not necessarily, an attention manager according to this aspect of the invention will include multiple content display systems and multiple content providing systems. The content providing systems will each be capable of providing one or more sets of content data, so that, overall, there will be multiple available sets of content data which can be of different types. There can also be multiple sets of instructions for enabling a display device to selectively display an image or images generated from a set of content data, which set of instructions may be tailored to display images from particular types of content data or to display content data using a particular display device.

According to yet another aspect of the invention, a computer readable medium can be encoded with one or more computer programs for enabling acquisition of a set of content data and display of an image or images generated from the set of content data on a display device during operation of an attention manager. The instructions of the computer program can include: i) acquisition instructions for enabling acquisition of a set of content data from a specified information source, ii) user interface installation instructions for enabling provision of a user interface that allows a person to request the set of content data from the specified information source, iii) content data scheduling instructions for providing temporal constraints on the display of the image or images generated from the set of content data, and iv) display instructions for enabling display of the image or images generated from the set of content data. The computer readable medium can also further include content data update instructions for enabling acquisition of an updated set of content data from an information source that corresponds to a previously acquired set of content data, the content data update instructions specifying where and when to obtain the updated set of content data. The content data scheduling instructions can specify, for example, the duration of time that the image or images generated from a set of content data can be displayed, an order in which the images generated from a plurality of sets of content data are displayed, a time or times at which the image or images generated from a set of content data can or cannot be displayed, and/or constraint on the number of times that the image or images generated from a set of content data can be displayed. The display instructions can be tailored to enable display of the image or images generated from a set of content data on a display device of a particular type, or display of an image or images generated from a set of content data of a particular type.

According to still another aspect of the invention, a computer readable medium can be encoded with one or more computer programs for enabling a content display system to selectively display on a display device, in an unobtrusive manner that does not distract a person from a primary interaction with an apparatus associated with the display device, an image generated from a set of content data. The instructions of the computer program can include:

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images generated from the clips of one or more sets of content data are displayed by a content display system. The content display system integrates scheduling information associated with the sets of content data to produce a schedule according to which the images corresponding to the sets of content data are displayed for a particular user of the attention manager.

A set or sets of instructions for enabling a display device to selectively display images generated from one or more sets of content data are also made available to users of the attention manager. The instructions include application instructions, control instructions and content data acquisition instructions. Typically, the instructions enable images generated from content data to be displayed automatically, without user intervention, in a predetermined manner, thereby enhancing the capability of the attention manager to occupy the user's peripheral attention. Different sets of instructions can be formulated, such that only images generated from sets of content data that are compatible with a particular set of instructions can be displayed using that set of instructions. Typically, an application manager establishes a standard set or sets of instructions which content providers can tailor to fit their needs or desires.

As indicated above, the sets of content data represent sensory data, i.e., data that can be used to generate images as defined above. Typically, the sensory data is either video or audio data. The kinds of content data that can be used with the attention manager are virtually limitless. For example, video data that might be used as content data includes data that can be used to generate advertisements of interest to the user, moving and still video images which can be real-time or pre-recorded (e.g., nature scenes, pictures of family members, MTV music segments, or video from a camera monitoring a specified location, such as ski slopes or a traffic intersection, for conditions at that location), financial data (e.g., stock ticker information) or news summaries. Audio data that might be used as content data includes data that can be used to generate, for example, music or news programs (e.g., radio talk shows).

The attention manager according to the invention is useful both to users of the attention manager and to content providers. For users, the attention manager provides information to a user in which the user has expressed an interest. In particular, the attention manager provides information to a user that the user might not otherwise expend adequate energy to obtain. Additionally, the information is presented to the user in a manner that uses portions of the user's attention capacity that may otherwise be filled with extraneous information. Further, a variety of information can be displayed (i.e., images can be generated from more than one set of content data), so that the user does not have to choose particular information to the exclusion of all other information.

For content providers, the attention manager affords an opportunity to disseminate information to users that are interested in receiving such information, thus enabling the content providers to provide better directed information dissemination. Moreover, the attention manager provides access to the previously unused attention capacity of those interested users. Further, since information from more than one content provider can be displayed, content providers are more likely to have their information displayed, since their information is displayed in addition to, rather than instead of, the information of other content providers, thereby reducing the need to compete with other content providers for the attention of the user.

FIG. 1 is a flow chart of a method 100 that implements an attention manager according to an embodiment of the inven-

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tion. The method 100 is performed by a content display system according to the invention. The content display system can be implemented, for example, using a digital computer that includes a display device and that is programmed to perform the functions of the method 100, as described below. Below, the method 100 is described as implemented on such a digital computer, though the method 100 could be implemented on other apparatus.

As shown by block 101, initially (i.e., before operation of the attention manager begins), a user is engaged in a primary user interaction, e.g., a primary user interaction with a computer. Though shown in FIG. 1, the primary user interaction of block 101 does not form part of the method 100 according to the invention. "Primary user interaction" is to be construed broadly and, generally, includes any operation of the computer (or other apparatus with which the user is engaging in an interaction) other than operation that is part of the attention manager according to the invention. When the user is interacting with a computer, the primary user interaction includes any operation of the computer that occurs to enable or to support the performance of the function or functions that provide the basis for the user's use of the computer. For example, the primary user interaction can be the use of any of a variety of conventional application programs (e.g., word processing programs, spreadsheet programs, personal finance programs, game programs, drawing programs, online services and Web browsers, among others). The primary user interaction can also be, for example, simply the operation of a conventional computer operating system, such as the Windows (e.g., Windows 3.1, Windows NT or Windows 95) or DOS operating systems produced by Microsoft Corp. of Redmond, Wash. or the Macintosh operating system produced by Apple Computer, Inc. of Cupertino, Calif., among others. While, typically, the display device produces a display as a result of the primary user interaction, this need not necessarily be the case.

The method 100 actually begins with the block 102. In the step shown in the block 102 (referred to hereinafter as step 102), a determination is made as to whether an "idle period" has occurred. Generally, as used herein, "idle period" refers to a period of time of specified duration during which a specified condition does not occur. However, typically, the specified condition is one having the characteristic that failure of the condition to occur is indicative of an extended lack of intensive (or focused) interaction with the computer by the user ("user inactivity"). For example, the specified condition could be the lack of an input from an input device of the computer, e.g., the absence of striking a key on a keyboard, clicking a mouse, pressing on a touch-sensitive area of a touchscreen or issuing a voice command. Alternatively, the attention manager could be implemented with an apparatus that can monitor the environment of the apparatus (e.g., with a video camera) and evaluate the environment to ascertain that an "idle condition" (e.g., the viewing direction of the user of the apparatus is turned away from the apparatus by a specified amount for a specified period of time) has occurred, such idle condition triggering operation of the attention manager.

Theoretically, any duration of time can be specified to define the idle period. However, practically, the duration of time necessary to constitute an idle period cannot be so short that the attention manager begins operating at times that inhibit the user's primary interaction with the computer or that distract or annoy the user. Further, the duration of time chosen, as indicated above, should be sufficiently long to indicate an extended lack of interaction with the computer, suggesting that the user is not engaged in an interaction with

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the computer that the user would not want to have interrupted. However, the duration of time should not be so long that, for periods of user inactivity of a typical duration, the amount of time that the attention manager operates is undesirably short. In sum, choosing the duration of time that defines an idle period involves a balancing of the above considerations. Illustratively, the idle period can be defined as a period of between thirty seconds and two minutes during which the specified condition (e.g., user interaction with an input device) does not occur.

While detection of the idle period can be implemented in any suitable manner, one way in which such detection can be implemented is by monitoring an idle timer that is part of a screen saver API (application program interface) that is, in turn, part of an operating system used to operate the computer. Such screen saver APIs are commonly found in current operating systems such as the Windows or Macintosh operating systems discussed above. The idle timer could be monitored and a signal that an idle period has occurred generated when the magnitude of the idle time as indicated by the idle timer reaches a predefined threshold.

Detection of an idle period as the basis for beginning operation of the attention manager is an indirect activation of the attention manager. In an alternative embodiment, step 102 of the method 100 is modified so that the attention manager is activated directly by the user. In other words, step 102 would consist of waiting for explicit direction from the user to begin operation of the attention manager. Such explicit direction could be enabled with an appropriate user interface, such as an on-screen icon or a menu selection, that is always present on the display screen of the display device as part of a standard interface that is provided by the operating system. Examples of such standard interfaces are the "Apple Menu" provided as part of the Macintosh operating system, and the "Start Menu" or desktop icons provided as part of the Windows 95 operating system.

Returning to FIG. 1, if, in step 102, an idle period has not occurred, then the primary user interaction continues (block 101). The method 100 continues executing the step 102 at predefined time intervals (typically very short time intervals), thereby continually and frequently checking for the occurrence of an idle period.

If, in step 102, an idle period is detected, then, in the step shown in the block 103 (hereinafter referred to as step 103), a determination is made as to whether there are any sets of content data available for use in generating a display. (Hereinafter, reference is sometimes made to "displaying content data" or "displaying a set of content data"; it is to be understood that this means displaying images generated using the content data or set of content data.) Herein, "content data" refers to data that is used by the attention manager to generate displays (e.g., video images or sounds, or related sequences of video images or sounds). A "set of content data" refers to a related set of such data that is used to generate a particular display. A "clip" refers to a definable portion of a set of content data that is used to generate a particular image; a set of content data can include one or more clips and, therefore, can be used to generate one or more images. The acquisition of content data by the content display system is described in more detail below. Here, it is sufficient to note that, over time, an attention manager can acquire any number of sets of content data that can be displayed by the content display system.

If, in step 103, no sets of content data are available for display, then the primary user interaction continues (block 101). The method 100 continues executing the steps 102 and

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at predefined time intervals, continually checking for the occurrence of an idle period and the acquisition of at least one set of content data.

If, in step 103, at least one set of content data is available for display, then, in the step shown in the block 104 (hereinafter referred to as step 104), the available sets of content data are scheduled for display by the content display system. (Alternatively, in other embodiments of the invention, scheduling of the sets of content data can occur before the method 100 begins. Such scheduling might be implemented, for example, so that each time a new set of content data is received by the content display system, the schedule is revised to include the new set of content data.) Typically, when the content display system acquires a new (or updated) set of content data, scheduling information for that set of content data is also acquired. Taken together, the scheduling information for all of the sets of content data is used to determine a schedule for display of the sets of content data by the content display system. Generally, determining a display schedule involves specifying the order in which the sets of content data are to be displayed and the duration of time for which each set of content data is to be displayed. The determination of the display schedule can also accommodate (to the extent possible) any special scheduling parameters for particular sets of content data (e.g., restrictions specifying when a particular set of content data must be displayed or cannot be displayed), mediating any conflicts between the display requirements of particular sets of content data. Often, though not necessarily, once the order and duration of display are established, the sets of content data are repetitively displayed by cycling through the display schedule repeatedly until operation of the attention manager is terminated. However, even where such iteration through the display schedule occurs, the display schedule can also accommodate scheduling parameters that delete sets of content data from the display schedule during particular iterations, thereby, for example, controlling the frequency with which particular sets of content data are displayed. The display schedule can be stored in an appropriately structured database, as known by those skilled in the art, that is stored in a memory of the computer used to implement the content display system.

Any appropriate set of rules, that can, for example, be arranged in any appropriate hierarchical manner, can be used for establishing a display schedule and, in particular, mediating conflicts between conflicting scheduling parameters associated with different sets of content data. For example, one rule for mediating conflicts may give preference to displaying sets of content data so that the sets of content data are displayed inversely to the order in which they were obtained by the content display system. This rule might be further specified so that a set of content data that has never previously been displayed by the attention manager is displayed prior to display of a set of content data that has been previously displayed, even though an update of the previously displayed set of content data has been obtained at a later time than that at which the never displayed set of content data was obtained. Another rule for mediating conflicts might resolve a conflict between two sets of content data having scheduling parameters that specify display at the same sequential position in the display schedule by randomly selecting one of the sets of content data to be displayed first during each iteration through the display schedule. Still another rule for mediating conflicts might establish a hierarchy of kinds of content data, with sets of content data of kinds at the top of the hierarchy being given preference for display over those at the bottom. Yet another

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rule or set of rules for mediating conflicts may involve performing some sort of analysis of the characteristics of the sets of content data that have been obtained by a particular content display system to ascertain preferences indicated thereby, and giving preference to sets of content data that are evaluated to be relatively more preferred. Scheduling rules of this kind would typically be part of the scheduling parameters provided independent of the content providers (i.e., in content display system scheduling instructions, as discussed elsewhere herein and, in particular, with respect to FIGS. 3A through 3C below).

Other scheduling rules, not directed to mediating conflicts between sets of content data, can also be used in determining a schedule. For example, any set of content data that has been initially obtained before a certain time and/or that has been last updated before a certain time (i.e., a set of content data that is "stale") can be automatically precluded from being inserted into the display schedule. This exclusion could further be restricted to apply only to certain sets of content data or content data of certain kinds. Similarly, the frequency with which a particular set of content data appears in a display schedule can be based upon how stale the set of content data is. Scheduling rules of this kind would typically be part of the scheduling parameters provided by a content provider for a set of content data (i.e., in tailored content data scheduling instructions, as discussed elsewhere herein and, in particular, with respect to FIGS. 3A through 3C below).

The particular scheduling rules used may be influenced by the characteristics of a particular embodiment of the attention manager, such as the available kinds of content data or the characteristics of the potential users of the attention manager. The particular scheduling rules used may also be influenced by the need or desire to simplify implementation of the scheduling rules.

Returning to FIG. 1, once the sets of content data have been scheduled for display, then, in the step shown in the block 105 (hereinafter referred to as step 105), a set of content data is displayed. The content display system is provided with one or more sets of display instructions to enable display of the set or sets of content data on the display device (as discussed elsewhere herein and, in particular, with respect to FIGS. 3A through 3C below).

After a set of content data has been displayed, then, in the step shown in the block 106 (hereinafter referred to as step 106), a determination is made as to whether operation of the attention manager has been terminated. Generally, operation of the attention manager can be terminated either directly or indirectly. Indirect termination of operation of the attention manager can be effected by, for example, causing operation of the attention manager to terminate when the specified condition (the non-occurrence of which is used to signal an idle period) occurs. For example, the attention manager can be terminated if the user makes an input to the computer using an input device, e.g., strikes a key on a keyboard, clicks a mouse, presses on a touch-sensitive area of a touchscreen or issues a voice command. For indirect termination, it may be desirable to add a further step or steps to the method 100 that, upon an indication that indirect termination should occur (e.g., the occurrence of the specified condition), asks the user to confirm that termination of the attention manager is, in fact, desired, and, if so, terminates the attention manager upon appropriate specified user input. In contrast to indirect termination, direct termination of operation of the attention manager can be effected by, for example, causing operation of the attention manager to terminate when the user selects a control option that specifies such termination, as described in more detail below with respect to FIGS 5A, 5B and 6.

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If, in step 106, operation of the attention manager has been terminated, then the primary user interaction begins again (block 101). The method 100 then begins executing the step 102 again, checking for the occurrence of an idle period.

If, in step 106, operation of the attention manager has not been terminated, then, in the step shown in the block 107 (hereinafter referred to as step 107), a determination is made as to whether there is an additional set of content data to be displayed. Typically, in operation of an attention manager according to the invention, there will always be another set of content data to be displayed, since, as discussed above, the sets of content data in the display schedule are iteratively displayed until operation of the attention manager is terminated. However, this need not be the case. For example, a limit can be established on the number of times that each set of content data can be displayed, or on the total number of times that any set of content data is displayed.

If, in step 107, there are no additional sets of content data to be displayed, then the primary user interaction begins again (block 101). The method 100 then begins executing the step 102 again, checking for the occurrence of an idle period.

25 If, in step 107, there are additional sets of content data to be displayed, then the method 100 returns to the step 105 and displays a set of content data in accordance with the previously determined display schedule. Steps 105, 106 and 107 are continuously performed, resulting in the continuous display of sets of content data, until either the user terminates the attention manager (step 106) or there are no more  
30 sets of content data to be displayed (step 107).

In another embodiment of the invention, a step could be added to the method 100, either in place of or in addition to the step 107, or as part of the step 106, that causes operation of the attention manager to terminate after the attention manager has been operating for a specified period of time.

Further, in another embodiment of the invention, an appropriate step or steps could be added to the method 100 so that, at a specified time, such as after each iteration through the display schedule, the method 100 returns to the step 104 and re-determines the display schedule.

As described above, when the method 100 ends, the primary user interaction (block 101) begins again. Preferably, the primary user interaction begins again with the status existent at the time that the method 100 began. Thus, the primary user interaction must be held in abeyance while the method 100 is operating. This can be accomplished by implementing the method 100 (or any other embodiment of the attention manager) with a content display system that is implemented on a computer that operates with an operating system that allows "multi-tasking" (here used to mean either the suspension of one program while one or more other programs operate, or the execution of one program simultaneously with the execution of one or more other programs). The Windows and Macintosh operating systems (mentioned above), among others, are operating systems having this characteristic. Where the attention manager is implemented using a screen saver API that is part of the operating system, such multitasking occurs automatically as a characteristic of the screen saver API, i.e., when operation of the attention manager ends, the user is returned to the status of the primary interaction existent at the time that the attention manager started operating. In multitasking operating systems that do not include a screen saver API, this feature of the invention can be implemented by use of an appropriately programmed device driver, as known by



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those skilled in the art, that monitors user interaction, suspending and restarting the primary user interaction at the beginning and end of operation of the attention manager.

The method 100 (FIG. 1) described above is an embodiment of the invention in which the attention manager presents information to a person (which can be the user or another person) in the vicinity of the display device during inactive periods when a user is not engaged in an intensive interaction with the computer (as indicated by the step 102 which checks for the occurrence of an "idle period" before beginning operation of the attention manager). As indicated above, in other embodiments of the invention, the attention manager presents information to the person during active periods, but in an unobtrusive manner. In such embodiments, video content data could be presented, for example, as "wallpaper" on the display screen of a video display monitor. Audio content data according to these embodiments could be presented in the same way as for the embodiments of the method 100 described above. For implementation of such embodiments of the invention, the step 102 of the method 100 could be modified to be a determination as to whether the attention manager has been activated (typically this would require direct activation by the user). Alternatively, step 102 could be eliminated altogether and the attention manager could be implemented to operate at any time that the computer is operating and sets of content data are available for display (step 103). For these embodiments, it is, as above, necessary that the content display system be implemented on a computer operated by an operating system that allows multi-tasking as described above. In particular, simultaneous operation of programs must be allowed, since the attention manager operates while the primary user interaction is ongoing (note that the relationships between the block 101 and the method 100 shown in FIG. 1 are not present in these embodiments of the invention).

Though not confined to such use, the attention manager according to the invention is envisioned as having particular use as a system implemented on, and used by, a network of computers. In such an implementation, each content providing system is implemented on a content provider computer. (It is possible to have more than one content providing system on a content provider computer.) Content display systems are implemented on user computers. The content provider computers and user computers are integrated together into a network such that each user computer can communicate with one or more of the content provider computers. The content provider computers need not (and typically would not) communicate with each other. Likewise, the user computers need not (and typically would not) communicate with each other. Further, each user computer need not communicate with all, or even more than one, of the content provider computers. For example, an attention manager according to the invention could be implemented so as to make use of a network such as the Internet. In particular, the graphical attributes of the World Wide Web would be particularly useful in enabling the provision of user interfaces that allow users to access the attention manager while visiting network sites of content providing systems.

FIG. 2 is a block diagram of a system 200 for implementing an attention manager according to an embodiment of the invention. The system 200 includes an application manager 201, a multiplicity of content providing systems, shown as Content Providers 1 through n (content providing systems 202a, 202b and 202c are illustrated in FIG. 2), and a multiplicity of content display systems, shown as Users 1

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through n (content display systems 203a, 203b and 203c are illustrated in FIG. 2). Hereinafter, the content providing systems and content display systems are referred to generally using the numerals 202 and 203, respectively. In FIG. 2, the solid lines indicate that communication must occur in the system 200 and the dashed lines indicate that communication may occur. However, note that, in another embodiment of the invention, the application manager 201 is not present, and communication between any particular content display system and particular content providing system need not necessarily occur.

The application manager 201, content providing systems 202 and content display systems 203 can be implemented using appropriately programmed digital computers. Generally, the computers can be any conventional digital computers including an input device (such as a keyboard, mouse or touch screen), an output device (such as a conventional computer display monitor and/or one or more audio speakers), a processing device (such as a conventional microprocessor), a memory (such as a hard disk and/or random access memory), additional conventional devices necessary to interconnect and enable communication between the above-listed devices, and communications devices (e.g., a modem) for enabling communication with other computers of the system. For example, the application manager 201 and content providing systems 202 can be implemented using conventional server computers, while the content display systems 203 can be implemented using conventional client computers. The application manager 201, content providing system 202 and content display systems 203 could also themselves each be implemented by a client-server network of computers. Communication between the computers can be accomplished using any appropriate communication transmission lines, such as conventional telephone lines, or high speed data transmission systems such as T1, T3 or ISDN. The communication can be managed using any appropriate conventional networking methods (e.g., computer programs and protocols) and apparatus, as known by those skilled in the art. In particular, as described further below, the computers are programmed to enable the content display systems 203 to communicate with the content providing systems 202 and application manager 201 even without direct action by the user. In addition to being programmed to enable networking, each of the computers is also appropriately programmed, as described above and below, to perform the functions of the application manager 201, content providing systems 202 and content display systems 203, as appropriate.

FIGS. 3A, 3B and 3C are schematic diagrams illustrating the functional components of the application manager 201, a content providing system 202 and a content display system 203, respectively, according to an embodiment of the invention. Each of the functional components are represented by a set of instructions and/or data. (In particular, each of the sets of instructions may include, if appropriate, data related to accomplishment of the functions associated with the set of instructions; similarly, a set of content data may include, if appropriate, instructions that enable generation of an image from the set of content data.) Each of these sets of instructions and/or data can be embodied in an appropriate computer program or set of computer instructions (the latter capable of including computer instructions and data), or an appropriate set of data configured for use by a set or sets of instructions (e.g., computer program) that must interact with the set of data in order to implement the attention manager.

The application manager 201 stores a variety of instructions for use in implementing the attention manager. As

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shown in FIG. 3A, generally, the application manager 201 stores application instructions 310, control instructions 320, and content data acquisition instructions 330 that can be disseminated to the content display systems 203 and content providing systems 202 as necessary or appropriate. The application manager 201 can also store audit instructions 340 that can be used to enable monitoring of usage of the attention manager.

The application instructions 310 include operating instructions 311 for beginning, managing and terminating operation of the attention manager on a content display system 203, and content display system scheduling instructions 312 for scheduling the display of content data on a content display system 203. The method 100 (FIG. 1) described above is one embodiment of such application instructions 310. The application instructions 310 also include installation instructions 313 that enable the other instructions used by the attention manager to be implemented using the hardware that is part of and associated with a particular content display system 203. The installation instructions 313 can be implemented as known by those skilled in the art. For example, the installation instructions 313 can be a "plug-in" or "helper" application program (such as a helper application that can be used with the Navigator and Mosaic software programs made by Netscape Communications Corp. of Mountain View, Calif.) that is used to process instructions or data of a particular type—in this case, instructions to implement the attention manager, and content data for use with the attention manager, that can be installed on the hardware of a particular content display system 203. There can be a multiplicity of such helper applications, each capable of operating on particular hardware that could be used to implement a content display system 203. The helper application enables the software program (i.e., Navigator or Mosaic) being used to access the sites of content providers to process references (e.g., Universal Resource Locators, or "URLs") to the particular type of instructions and/or data, so that sets of content data (including updated sets of content data) and the application instructions 310, control instructions 320 and content data acquisition instructions 330 (including updated versions of those instructions) can be acquired.

The control instructions 320 include display instructions 321 and content data scheduling instructions 322, as described in more detail below, that are typically enhanced by content providers in a particular manner that is appropriate for the content data that the content providers provide. The application manager 201 can (and typically does) store and disseminate multiple distinct sets of control instructions 320. Generally, the display instructions 321 of a particular set of control instructions 320 enable display of content data on a particular type of display device (e.g., a particular type of computer video display or a particular type of audio speaker) or display of a particular type of content data. Display instructions 321 that can be used with a particular display device are typically already developed by third parties (e.g., the maker of the display device) and are readily available. Tailoring of the display instructions 321 to display particular types of content data (such as instructions for displaying content data that is in the GIF format or the format of AutoDesk Animator FLC files) can be done by either the application manager 201 or a content provider. The content data scheduling instructions 322 provide temporal constraints on the display of particular sets of content data. As stored by the application manager 201, the content data scheduling instructions 322 are usually the same for each set of control instructions 320 and provide a generic set of scheduling instructions that can be tailored by a content provider.

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The content data acquisition instructions 330 include acquisition instructions 331 for enabling the initial acquisition of a set of content data and instructions for implementing the attention manager, and content data update instructions 332 for enabling update of previously obtained sets of content data and attention manager instructions. The acquisition instructions 331 and content data update instructions 332 are generic sets of instructions that can be tailored by a content provider. The content data acquisition instructions 330 can also include user interface installation instructions 333 that enable content providers to install a user interface in the information environment (e.g., Web page) of the content provider so that users can request sets of content data from the content provider. Such user interface installation instructions are conventional and readily available for use with the attention manager of the invention.

As shown in FIG. 3B, the content providing systems 202 store one or more sets of content data 350 that can be disseminated to content display systems 203 as requested. The content providing systems 202 can also store the application instructions 310, control instructions 320, and content data acquisition instructions 330 described above.

As indicated above, each set of content data 350 defines a related group of data that is used to generate a particular display and includes one or more clips that each represent a definable portion of the set of content data that is used to generate a particular image. The content data 350 represents sensory data and can be, for example, video or audio data. A particular set of content data 350 can be formulated in different versions that are each compatible with content display systems 203 having particular characteristics. In particular, the characteristics of the display device of a content display system 203 can affect the formulation of a set of content data 350. For example, for computer video display monitors, the formulation of a version of a set of content data 350 can depend on the size of the display screen (e.g., horizontal length by vertical length), the display resolution (e.g., the number of horizontal pixels by the number of vertical pixels), the color depth (number, e.g., 256, of possible colors) and the characteristics of the display drivers for the display device. The formulation of a version of a set of content data 350 could also depend upon the operating system being used by the computer on which the content display system 203 is implemented or other characteristics of the computer, such as the speed with which the display device can be operated (insofar as that speed is affected by the characteristics of the computer such as processor speed). Generally, a set of content data 350 can be formatted as known by those skilled in the art in view of the above considerations.

As indicated above, the control instructions 320 (as well as the content data acquisition instructions 330) are typically enhanced by content providers as appropriate for particular content data. The manner in which these instructions can be tailored by content providers is desirably required to conform to a specified format. Below, a description is given of package files that can be used for tailoring the control instructions 320 and content data acquisition instructions 330, as well identifying the location of content data. These package files can be created using an appropriate computer program (package file editor) that can be provided by, for example, the application manager 201 and that enables this tailoring to be accomplished easily and according to the specified format.

The content provider can tailor the content data scheduling instructions 322 to indicate the duration of time that a particular set of content data can be displayed ("duration



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instructions"). Generally, the duration instructions can be arbitrarily complex and can vary in accordance with a variety of factors, including, for example, the particular time at which the set of content data 350 is displayed after the attention manager begins operating, or the number of previous times that the set of content data 350 has been displayed during a continuous operation of the attention manager. The content provider can also tailor the content data scheduling instructions 322 to indicate an order in which the clips of a set of content data 350 are displayed, as well as the duration of the display for each clip ("sequencing instructions"). The content provider can also tailor the content data scheduling instructions 322 to indicate particular times or ranges of times at which a set of content data 350 can or cannot be displayed ("timing instructions"). These times can be absolute (e.g., a particular clock time on a particular day, a particular day or days during a week, after or before a specified date) or relative (e.g., not before or after a specified duration of time since the attention manager began operation, first or not first among the sets of content data 350 to be displayed, not after a particular kind or set of content data 350). The content provider can also tailor the content data scheduling instructions 322 to specify a maximum number of times that the set of content data 350 can be displayed after the attention manager begins operating or a maximum number of times that the set of content data 350 can be displayed over any number of operations of the attention manager ("saturation instructions").

The content provider can also tailor the display instructions 321 to display a particular set or sets of content data. The display instructions 321 can be tailored, for example, according to the type or types of the content data. The type of content data indicates the manner in which an image or images are generated from the content data (i.e., how the bit patterns in a particular clip are transformed into an image). The type of content data is typically established as a consequence of the manner (e.g., with a particular software application program such as the Photoshop or Premiere programs produced by Adobe Systems of Mountain View, Calif.) in which a particular clip is created. The installation instructions 313, discussed above, enable content data of different types to be obtained by the attention manager. Generally, the possible types of content data can be confined to an enumerated set of standard data types, such as the Mime data types used with the World Wide Web. As will be more readily understood from the description below, the type of content data can be specified, for example, in a field of the clip part of a package file.

The ability to tailor sets of content data 350 and associated control instructions 320 for particular content display systems 203, before the sets of content data 350 and control instructions 320 are provided to those content display systems 203, is advantageous because it allows the tailoring to be done once, by the content providing system 202 or the application manager 201, rather than multiple times, once by each content display system 203 that uses the set of content data 350 and associated control instructions 320.

The content data acquisition instructions 330—in particular, the content data update instructions 332—are also tailored by content providers as appropriate for particular sets of content data 350. In particular, the content provider can tailor the content data acquisition instructions 330 to indicate where and when to obtain an updated set of content data 350. For example, the indication of where to obtain an updated set of content data 350 can be accomplished by specifying an appropriate network address of a content providing system 202. The network addresses can be speci-

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fied by, for example, a URL used to identify, for example, an HTML file, an applet (a short application program written in Java or other suitable programming language), a script based on CGI or other suitable mechanism, or any other resource (i.e., computer program or set of data). The indication of when to obtain an updated set of content data 350 can be accomplished by specifying a time or times, either absolute time or times (i.e., particular dates and times during the day) or relative time or times (e.g., one month after the last acquisition/update of the set of content data 350). For example, the update schedule could be established to obtain updates every hour, every day or every week. Or, the update schedule could be established to obtain updates upon the occurrence of a particular event, such as a specified percentage increase or decrease in a stock market index. In general, the particular update schedule used will depend upon the character of the content data with which the update schedule is associated, e.g., content data representing stock prices would probably be updated more frequently than content data representing an advertisement.

As shown in FIG. 3C, the content display systems 203 store the application instructions 310, control instructions 320, and content data acquisition instructions 330 described above. The application instructions 310 use the control instructions 320 to display sets of content data 350 that are obtained (and updated, if appropriate) by the content data acquisition instructions 330. The application instructions 310 and control instructions 320 are discussed generally, and with respect to particular embodiments, in more detail above, while an embodiment of the content data acquisition instructions 330 is described below.

FIG. 4 is a flow chart of a method 400 according to the invention for acquiring and updating sets of content data, i.e., the method 400 is an embodiment, at least in part, of the acquisition instructions 331 and content data update instructions 332 of the content data acquisition instructions 330 discussed above with respect to FIGS. 3A through 3C. In the method 400, the steps shown by blocks 402 through 407 can be implemented in the acquisition instructions 331 and the steps shown by blocks 403 through 410 can be implemented in the content data update instructions 332. Generally, the steps of the method 400 can be implemented on an appropriately programmed digital computer that is programmed to perform the functions of the method 400, as described below. Below, the method 400 is described as implemented on such a digital computer, though the method 400 is not limited to such an implementation. The method 400 necessitates communication between a content display system 203 and one or more content providing systems 202. As will be understood by those skilled in the art of digital computer programming for computer network communications, when the method 400 is implemented using a programmed digital computer, particular steps of the method 400 could be implemented on either a content display system 203 or a content providing system 202.

In the step shown in the block 401 (referred to hereinafter as step 401), a set of content data is selected for display by the attention manager. Initially, in step 401, particular sets of content data are obtained as a result of direct request by the user. Any appropriate user interface can be used for enabling a user to directly request a particular set of content data. For example, Web pages on the World Wide Web could include graphical buttons for enabling users that visit the Web page to request particular sets of content data. Selection of a button on a Web page results in an indication to the appropriate content providing system 202 that the requesting content display system 203 has requested the set of content

If the content display system 203 does have the application instructions 310 (step 402), then, in the step shown in the block 403 (referred to hereinafter as step 403), a determination is made as to which version or versions of the application instructions 310 the content display system 203 has. As indicated elsewhere, a particular set of content data 350 can (and typically will) be updated from time to time, thereby creating different versions of the set of content data 350. Likewise, the application instructions 310 can also be updated, thereby creating different versions of the application instructions 310. In general, a set of content data 350 can be updated without regard to whether the set of content data is compatible with all versions of the application instructions 310 (though the set of content data 350 must be compatible with at least one version of the application instructions 310). Likewise, the application instructions 310 can be updated without regard to whether any particular set of content data 350 is compatible with that version of the application instructions 310. Moreover, particular versions of the application instructions 310 may be compatible only with sets of content data 350 of certain types. Consequently, a particular content display system 203, even though the content display system 203 has the application instructions

Returning to FIG. 4, in the step shown in the block 406 (referred to hereinafter as step 406), the content providing system 202 provides the current set of content data 350 to the content display system 203. (In practice, the set of content data 350 can be provided before, after or simultaneously with provision of the application instructions 310.)



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Further, as described above, a particular set of content data 350 can exist in different versions that are each compatible with the content display system 203 to which the version of the set of content data 350 is being provided. The step 406 can include a determination as to the version or versions of the set of content data 350 that can be used by the requesting content display system 203, so that a properly formulated set of content data 350 is acquired.

A set of control instructions 320 and content data acquisition instructions 330 (FIGS. 3A through 3C) associated with the set of content data 350 can also be provided, as shown by the step of block 407 (referred to hereinafter as step 407). Typically, a check is made (like that for the application instructions 310 and providing similar benefits) to determine whether the content display system 203 already has a compatible (and/or current) version of the control instructions 320 and/or the content data acquisition instructions 330 associated with the set of content data 350 being obtained.

Each set of content obtained by a content display system 203 can be stored in a database (having any suitable structure) that is stored in a memory of the computer used to implement the content display system 203. The database can also store other information associated with each set of content data 350. This information is discussed in more detail below in the discussion of package files which can be used to convey such information from the content providing systems 202 to the content display systems 203. The package file editor mentioned above can be provided to each content providing system 202 to enable the content provider to easily create a package file for each set of content data 350 provided by that content provider.

Each package file includes a reference to the set of content data 350 (e.g., a network address) to which that package file corresponds. As mentioned above, each package file can also include a variety of other information. For example, the package file can include a specification of the format of the content data 350 (i.e., an indication of the types of content display systems 203 with which the set of content data 350 is compatible) and the type of the content data (e.g., an identification of a particular graphical format, as discussed above). (This information might be specified explicitly or implicitly; alternatively, this information may be passed to the content display system 203 separately from the package file.) The package file can additionally include a text description of the contents of the package file (this could be used, for example, in a user interface that lists descriptions of all of the sets of content data available to a content display system 203 or provided by a content providing system 202). The package file can also include information governing the presentation of the set of content data, such as screen position, special animation effects and display duration (the latter is shown by the View-Time attribute in the Example below). The update information (location and schedule) is also included in the package file. The package file can also include linking information (e.g., network address of an information source) used to implement a link option discussed in more detail below. The content data scheduling information discussed above can also be included in the package file. The package file can also include data structures that can be used to store auditing information, as discussed in more detail below. The package file can also include reference to one or more sets of control instructions 320, each set of control instructions 320 enabling display of the set of content data 350 by a content display system 203 having a particular architecture, or enabling display of clips of particular types.

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The following Example illustrates how a package file for use with the invention could be constructed. The package file of this Example does not include all types of information that could be included in a package file; it is to be understood that other types of information (as discussed above, for example) could be included in such a package file, expressed in a similar manner to that shown in the Example. In this illustration, the package file is constructed in an object-oriented manner. Generally, each statement in the package file conforms to the following syntax:

keyword{attribute:value (1) . . . attribute:value(n)}  
where "keyword" can be either PACKAGE or CLIP, "attribute" identifies one of the types of information discussed immediately above, and "value" is an identification of particular content for the type of information. There can be any number of "attribute:value" pairs in a statement. In the Example, each attribute:value pair is designated at right by a numeral enclosed in parentheses to aid in the description; this numeral does not form part of the package file shown in the Example.

## Example

```

PACKAGE {
  Object-Id: 1 (1)
  Object-Type: 1 (2)
  Source: http://www.interval.com/~freiberg/ (3)
         Netscreen/Bookreviews/reviews.nss
  Name: Book Reviews: Day 1 (4)
  Description: (5)
  Update-Frequency: 720 (6)
}
CLIP {
  Object-Id: 16919316 (7)
  Object-Type: 2 (8)
  Source: http://www.interval.com/~freiberg/ (9)
         Netscreen/Bookreviews/1%20Day%20Book/
         bookreview-1-a1.gif
  Name: Anger (10)
  Description: Book Review (11)
  Update-Frequency: 0 (12)
  View-Time: 15 (13)
  Followup-URL: http://www.randomhouse.com/ (14)
                knopf/
  Linked-To-Following: 1 (15)
}
CLIP {
  Object-Id: 16919384 (16)
  Object-Type: 2 (17)
  Source: http://www.interval.com/~freiberg/ (18)
         Netscreen/Bookreviews/1%20Day%20Book/
         bookreview-1-a2.gif
  Name: Emotional Intelligence (19)
  Description: (20)
  Update-Frequency: 0 (21)
  View-Time: 15 (22)
  Followup-URL: http://www.randomhouse.com/ (23)
                knopf/
  Linked-To-Following: 0 (24)
}

```

The first part of line 1 indicates that the following describes a package file. The remainder of line 1 and line 2 are used in debugging and are not relevant to the invention. Line 3 specifies a network address that identifies the location of the package file. (Note that the type of the package file is suggested in line 3 by the file extension .nss, though this extension is not necessary to specify the type. This extension can be used to implicitly specify the type of the package file to the content display system 203.) Lines 4 and 5 each give a description of the contents of the package file that can be used, for example, in a user interface to identify the package file. Line 6 specifies the frequency of acquisition of updates to the set of content data 350 and related instructions that are described by the package file. (In this Example, the frequency is specified in minutes.) The first part of line 7



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indicates that the following describes a clip in the package file. The remainder of line 7 and line 8 are similar to lines 1 and 2. Line 9 specifies a network address that identifies the location of the clip. (Similarly to line 3, the type of the clip is suggested in line 9 by the file extension .gif, though, again, this extension is not necessary to specify the type.) Lines 10, 11 and 12 are similar to lines 4, 5 and 6. (Note that, in line 12, the specification of "0" for the update frequency indicates that the clip is never updated.) Line 13 specifies the duration of display for this clip. (In this Example, the duration is specified in seconds.) Line 14 specifies a network address of an information source to which a link can be established during display of this clip. (This aspect of the invention is described in more detail below with respect to the "more" option 602d of FIG. 6.) Line 15 specifies the number of additional clips that are part of this package file. Lines 16 through 24 are similar to lines 7 through 15.

When a content display system 203 receives a new package file from a content providing system 202, the content display system 203 first determines whether the contents of a corresponding package file (i.e., either the same package file or an earlier version of the package file) already exist as part of the database. This can be done by scanning a list of entries in the database that each indicate the presence of the contents of a particular package file. If the contents of a corresponding package file are not present, then a new entry is created in the list and the contents of the new package file are stored as part of the database (in accordance with the structure of the database). As part of the process of storing the contents of the package file, the contents are transformed into a form that is compatible with the architecture of the content display system 203 (this is enabled by the installation instructions 313 discussed above).

As described above, the database of content data and related information is constructed from a package file that can have a particular format, as illustrated in the Example above. However, generally, such a database can be constructed from files having any format (e.g., an ASCII file) that enables specification of the information described above that a package file includes.

Returning to FIG. 4, as indicated above, when a set of content data 350 is obtained (step 406), corresponding control instructions 320 and content data acquisition instructions 330 are also obtained (step 407) if such instructions have not already been acquired by the content display system 203. In particular, content data update instructions 332 can be obtained, so that updates to the set of content data 350 and/or the associated control instructions 320 and content data acquisition instructions 330 can be obtained in the future. As mentioned above, the content data update instructions 332 include a description of the location of the content providing system 202 from which the updates can be obtained as well as a schedule of times at which such updates should be obtained.

In the step shown in the block 408 (referred to hereinafter as step 408), a determination is made as to whether it is time to update the set of content data 350. The update schedule discussed above is used for this purpose. As long as the schedule indicates that no update need be obtained, the method 400 continues executing the step 408, thereby continuously monitoring whether an update need be obtained. The monitoring of step 408 could be implemented, for example, by a procedure that monitors the content display system computer clock and indicates that an update should be obtained when the clock time is equal to a time in the update schedule.

The update schedule can be established according to any desired criteria. For example, preferably, though not

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necessarily, the step 408 (and the steps 409 and 410 discussed below and, as necessary, the steps 403 through 407 discussed above) of the method 400 operates at any time that the computer (or computers) with which the content display system 203 is implemented is on, even when the attention manager is not operating. Thus, the update schedule could be established so that updates are obtained during the middle of the night, when charges for communication with content providing systems 202 are cheaper. Preferably, then, at least this part of the content display system 203 is implemented on a computer that is always on, so that such cheap communications time can be utilized for obtaining updates. This can be particularly feasible if the content display system 203 is implemented on a client-server network in which at least the content data update instructions 332 are executed by a server computer which remains on at all times. If, however, the computer on which the content data update instructions 332 are executed is turned off at a time when an update is scheduled to be retrieved, then the update can occur immediately after the next time that the computer is turned on.

This aspect of the content data acquisition instructions 332 can be implemented, for example, using a communications daemon that is part of the content data update instructions 332. When the content data update instructions 332 are acquired by a content display system 203, the daemon is inserted into a startup file that is executed at the beginning of operation of the operating system of the computer with which the content display system 203 is associated. The daemon causes a connection to be made to each location from which the content data update instructions 332 indicate that an update is to be acquired. For example, if the computer uses a Windows operating system, the daemon initiates a WinSock TCP/IP connection to enable connection to be made to the locations of the updated sets of content data 350.

Returning to FIG. 4, once it is determined that an update of the set of content data 350 should be obtained, then, in the step shown in the block 409 (referred to hereinafter as step 409), the location of the appropriate content providing system 202 is ascertained from the scheduling information, and that location is accessed.

In the step shown in the block 410 (referred to hereinafter as step 410), a determination is made as to whether an updated set of content data 350 is available on the content providing system 202. If an updated set of content data 350 is not available, then the step 408 begins executing again, continuing until the update schedule indicates that it is again time to check for an updated set of content data 350. If an updated set of content data 350 is available, then the method 400 returns to the step 403, and an updated set of content data 350 and, if necessary, related control instructions 320 and content data acquisition instructions 330 are provided to the content display system 203 (i.e., an appropriate package file is provided to the content display system 203). As discussed above, the content display system 203 compares the version of the package file contents stored in the database to the contents of the version of the package file being newly provided, and makes changes to the database as necessary.

FIGS. 5A and 5B together are a flow chart of a method 500 that implements an attention manager according to another embodiment of the invention. Like the method 100 (FIG. 1), the method 500 is performed by a content display system 203 according to the invention which can be implemented, for example, using a digital computer that includes a display device and that is programmed to perform the functions of the method 500, as described below. Below, the method 500 is described as implemented on such a



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digital computer, though the method 500 could be implemented on other apparatus. Steps in the method 500 that are the same as steps in the method 100 are shown by like-numbered blocks. Generally, the method 500 differs from the method 100 in that the method 500 provides a number of control options that enable the user to effect particular types of control of the attention manager. While the method 500 and the associated description below illustrate several control options that can be used with an attention manager according to the invention, it is to be understood that an attention manager according to the invention could include any of a number of other options not shown in FIGS. 5A and 5B, or described specifically herein.

The attention manager according to this embodiment of the invention can include any suitable user interface to enable the user to specify a control option. FIG. 6 illustrates a computer display screen 600 including one embodiment of such a user interface. The screen 600 displays, in addition to an image generated from a set of content data 350, a dialog box 601 that includes a list of available control options 602a through 602e. The dialog box 601 can remain on the screen 600 during the entire time that the attention manager is operating. The available control options 602a through 602e shown in the dialog box 601—as well as additional control options that could be, but are not, included in the dialog box 601—are discussed in more detail below.

The manner of selecting an option depends upon the available user input device(s). For example, a keyboard could be used to move a cursor to a desired option, which is then selected using the Enter key. Or, a mouse could be used to move a cursor to a desired option, then clicked to select the option. Or, a touch pen could be used to contact the screen 600 (if the screen 600 is a touch-sensitive screen) at an appropriate location to cause a desired option to be selected. Or, an audio command could be issued to a voice recognition system which causes the desired option to be selected.

One control option that can be used with an attention manager according to the invention enables the user to directly terminate operation of the attention manager. In FIG. 6, this is shown as the “exit” option 602a. In the method 500, this option is implemented using the step 107. As discussed above, selection of the “exit” option 602a causes the primary user interaction to begin again (block 101).

Another control option that can be used with an attention manager according to the invention enables the user to terminate display of the currently displayed set of content data and begin display of the next scheduled set of content data. In FIG. 6, this is shown as the “next” option 602b. In the method 500, this option is implemented by the step shown in the block 501.

Yet another control option that can be used with an attention manager according to the invention enables the user to terminate display of the currently displayed set of content data and begin display of the set of content data displayed immediately prior to the terminated set. In FIG. 6, this is shown as the “back” option 602c. In the method 500, this option is implemented by the steps shown in the blocks 502 and 511.

Still another control option that can be used with an attention manager according to the invention enables the user to terminate display of the currently displayed set of content data and remove that set of content data from the schedule so that the set will not be displayed in the future. This option is not shown in FIG. 6. In the method 500, this option is implemented by the steps shown in the blocks 503

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and 512. In a particular embodiment, this option can be implemented so that the set of content data is precluded from being displayed only during the current operation of the attention manager. In another particular embodiment, this option can be implemented so that the set of content data is removed from the content display system 203 entirely, i.e., the set of content data is no longer available for display. In this embodiment, the set of content data could only become available for display again if the user takes affirmative steps to re-obtain the set of content data, as described above with respect to step 401 of the method 400 (FIG. 4).

Another control option that can be used with an attention manager according to the invention enables the user to prevent future display of the currently displayed set of content data until that set of content data has been updated. This option is not shown in FIG. 6. In the method 500, this option is implemented by the steps shown in the blocks 504, 513, 521, 522 and 523 (referred to hereinafter as steps 504, 513, 521, 522 and 523, respectively). If this option is selected in step 504, then an update flag is activated. The update flag can be a designated field associated with a particular set of content data in the database that contains all of the available sets of content data. As shown by step 521, the method 500 identifies, before display of a next set of content data in the schedule, the identity of that next set, and determines (step 522) whether the update flag has been activated for that set of content data. If the update flag has not been activated, then, in step 105, the set of content data is displayed. However, if the update flag has been activated, then, in step 523, a determination is made as to whether the set of content data has been updated since the last time that the set of content data was displayed. This step can be accomplished by checking an update monitor flag that can be a designated field of the database that is associated with the set of content data. If the update monitor flag indicates that the set of content data has been updated since the last time that the set of content data was displayed, then the set of content data is displayed (step 105). Otherwise, the method 500 returns to the step 521 to identify the next set of content data in the schedule.

Yet another control option that can be used with an attention manager according to the invention enables the user to specify a level of satisfaction with the currently displayed content data. This option is not shown in FIG. 6. In the method 500, this option is implemented by the steps shown in the blocks 505, 514 and 515. Depending upon the level of satisfaction indicated in the step 514, the schedule can be modified (step 515) to show the set of content data more, less or at different times than was previously the case. This option can be implemented in any appropriate manner; one way is described immediately below.

The content display system scheduling instructions 312 can include instructions that evaluate a probability function each time that a set of content data in the schedule is presented for display, and either display or not display the set of content data dependent upon the evaluation of the probability function. The probability function can include consideration of a variety of factors (e.g., the amount of time that has passed since a particular set of content data has been updated), but for implementation of the instant option, the probability function includes a term  $n^p$ , where  $n$  is a constant between 1 and 2, and  $p$  is a variable that represents a user's preference for a particular set of content data. Initially, the value of  $p$  is 0. Each time that a user indicates a like or dislike for a set of content data (by, for example, selecting an appropriate option in a dialog box such as the dialog box 601), the variable  $p$  is incremented or decremented,

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respectively, by a predetermined amount. The content display system scheduling instructions 312 evaluate a stochastic probability function (e.g., a Gaussian probability function) using the evaluated probability function as an argument. If the result of evaluation of the stochastic probability function is "true", then the set of content data is displayed; if "false", then the set of content data is not displayed. As can be seen, then, initially (i.e., when  $p=0$ ), the user has expressed no like or dislike of a set of content data and the set of content data is displayed or not according to other criteria. Incrementing or decrementing  $p$  (i.e., expressing like or dislike for a set of content data) causes the term  $p^2$  to increase or decrease exponentially, thereby increasing or decreasing the likelihood that the set of content data will be displayed.

Still another control option that can be used with an attention manager according to the invention enables the user to establish a link with another information source. In FIG. 6, this is shown as the "more" option 602d. (In "wallpaper" embodiments of the invention, this option can be implemented so that any time the user clicks a mouse—or presses the "Enter" key on a keyboard—when the cursor is within the wallpaper, the link is made to the other information source.) In the method 500, this option is implemented by the steps shown in the blocks 506, 516 and 517. Links can be established to any of a variety of information sources and types of information sources. Typically, the link will be made to an information source that provides information that is related to the content data which was being displayed when the link was established. Upon selection by the user of this control option, the information source is accessed and additional information retrieved for presentation to the user. A link can be made, for example, to any information source that is part of a network which can be accessed by the computer with which the attention manager is being used (though it is not necessary that the link be made through a network). For example, the attention manager can be implemented so that links can be established to locations on the World Wide Web using the appropriate URLs. Such links can be established using any of a variety of Web browser software programs, such as the Navigator software program made by Netscape Communications Corp. Links are enabled by appropriately specifying the location (e.g., a network address) of the information source. The location of an information source (or locations of information sources) can be specified by associating the location with the set of content data, for example, in a package file as described and illustrated above.

As shown in the method 500, the attention manager continues to operate during the time that the link is established and the link is established to an information source from which it is possible to return to the attention manager (see step 517). The presentation of the new information to the user can include an appropriate user interface mechanism that allows the user to request such a return to the attention manager. However, the capacity to return to operation of the attention manager may not always exist. In that event, the step 517 is not part of the method 500; rather, the method 500 terminates after the step 516 and the user operates in the environment of the information source from that point forward. Such termination of the attention manager will frequently be the case where the link is made via a network to an information source.

Another control option that can be used with an attention manager according to the invention enables the user to obtain an overview of all of the content data available for display by the attention manager. This option is not shown

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in FIG. 6, nor is it implemented in the method 500 of FIGS. 5A and 5B. The overview could be presented textually, pictorially or aurally. The overview information can be obtained either via a link to another information location (e.g., the location of the application manager 201) as described above or from a memory associated with the content display system 203, the overview information having been communicated to the content display system 203 when a set of content data was obtained.

Still another control option that can be used with an attention manager according to the invention enables the user to maintain display of the currently displayed set of content data 350 until such display is terminated by the user. This option is not shown in FIG. 6, nor is it implemented in the method 500 of FIGS. 5A and 5B. Upon selection of this option, an appropriate user interface could be made to appear that allows the user to specify termination of the display. After termination of the display, the attention manager resumes normal operation, i.e., the next set of content data 350 is displayed.

The dialog box 601 also includes an additional option, the "cancel" option 602e. Selection of the "cancel" option 602e causes the dialog box 601 to be removed from the screen 600. The dialog box 601 can be made to reappear again using any appropriate technique. For example, the application instructions 310 can include appropriate instructions to cause the dialog box 601 to reappear when the user makes an input to the computer using an input device.

As discussed above (see FIG. 2), usage of the attention manager can be audited using audit instructions 340 (FIGS. 3A and 3C) that can be supplied by the application manager 201 to the content display systems 203, either directly or via the content providing systems 202. The audit instructions 340 can include instructions that cause a content display system 203 to record, as the attention manager is used, particular information (audit information) regarding use of the attention manager (or compute such information from other, more basic information recorded by the attention manager). The audit information can be stored by the content display system 203 in an appropriately structured database. The audit information can include, for example, the identity of each set of content data 350 displayed by the attention manager, the number of times that a set of content data 350 was displayed by the attention manager, the frequency (e.g., number of times per week) that a set of content data 350 was displayed by the attention manager, the times at which a set of content data 350 was displayed by the attention manager, a user-expressed satisfaction level for a particular set of content data 350, and the last set of content data 350 displayed to a user before the user either "passively" (i.e., by making an input to the computer with an input device) or "actively" (i.e., by selecting a control option) terminated operation of the attention manager (of interest, since the user presumably was viewing the display screen when such interaction occurred). The audit instructions can also include instructions that compile and/or analyze the audit information in a desired manner. The audit instructions 340 can also include instructions that cause audit information to be transmitted to a remote site (e.g., the application manager 201 or a content providing system 202). These instructions can include scheduling instructions that govern when the audit information is so communicated (e.g., after periodic time intervals), as well as instructions that identify the location (e.g., network address) of the remote site. The transfer of audit information can be accomplished, for example, using a conventional electronic mail mechanism, as known to those skilled in the art. The audit



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instructions 340 can also include instructions that enable the content display system 203 to display audit information. Additionally, the audit instructions 340 can include instructions that enable the user to disable the audit function entirely, or that enable the user to prevent audit information from being transmitted to the application manager 201 and/or to content providing systems 202. These last instructions could also be accompanied by operating instructions that provide a control option or options to the user, in a manner similar to that described above with respect to FIGS. 5A, 5B and 6, that enable the user to select disablement of the audit function. The audit instructions 340 can also include instructions that cause the database of audit information to be erased at an appropriate time, such as after the audit information has been communicated to a remote site.

Auditing of use of the attention manager can be useful to both users of the attention manager and content providers for a variety of reasons. Such auditing can be used, for example, to illustrate to content providers the value of the attention manager as a tool for disseminating the content provider's information, by showing the content providers how many content data display systems 203 are displaying the content provider's content data. The auditing can also give content providers insight into the interests of computer users, enabling the content providers to better target the information that the content providers provide. The auditing can also indicate to a user the amount and types of the information that the user has been receiving.

Various embodiments of the invention have been described. The descriptions are intended to be illustrative, not limitative. Thus, it will be apparent to one skilled in the art that certain modifications may be made to the invention as described without departing from the scope of the claims set out below. For example, though it is contemplated that an attention manager according to the invention will typically be used to occupy the peripheral attention of a human computer user, generally the attention manager can be used to occupy the attention of any sentient being. For example, the attention manager may be useful in occupying the attention of domesticated animals such as dogs or cats, or providing training (i.e., audio that can be repeated) for a "talking" bird such as a parrot.

We claim:

1. A system for engaging the peripheral attention of a person in the vicinity of a display device of an apparatus, comprising:

a content display system associated with the display device, the content display system including means for receiving a set of content data and a set of instructions for enabling a display device to selectively display, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from a set of content data, the content display system further including means for using the display device to selectively display the image or images using the set of instructions;

a content providing system including means for providing a set of content data to the content display system; means for providing to the content display system a set of instructions for enabling a display device to selectively display an image or images generated from a set of content data;

first communication means for enabling communication between the means for providing and the content display system;

second communication means for enabling communication between the content providing system and the content display system; and

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means for auditing the display of sets of content data by the content display system.

2. A system for engaging the peripheral attention of a person in the vicinity of a display device of an apparatus, comprising:

means for acquiring a set of content data from a content providing system;

means for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data; and

means for detecting an idle period of predetermined duration, wherein the means for selectively displaying displays the image or images automatically after detection of the idle period.

3. A system as in claim 2, further comprising means for detecting a predetermined user interaction with the apparatus subsequent to detection of the idle period, wherein occurrence of the predetermined user interaction causes the means for selectively displaying to stop displaying an image or images generated from a set of content data.

4. A system for engaging the peripheral attention of a person in the vicinity of a display device of an apparatus, comprising:

means for acquiring a set of content data from a content providing system;

means for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data;

means for displaying one or more control options with the display device while the means for selectively displaying is operating;

means for selecting a displayed control option; and means for controlling aspects of the operation of the system in accordance with a selected control option.

5. A system as in claim 4, wherein:

the control option enables the user to request termination of operation of the system; and the means for controlling terminates operation of the system.

6. A system as in claim 4, wherein:

the means for selectively displaying further comprises means for scheduling the display of an image or images generated from a set of content data;

the control option enables the user to request display of a next image or images generated from a next set of content data; and

the means for controlling displays the next image.

7. A system as in claim 4, wherein:

the means for selectively displaying further comprises means for scheduling the display of an image or images generated from a set of content data;

the control option enables the user to request display of a previous image generated from a previous set of content data; and

the means for controlling displays the previous image.

8. A system as in claim 4, wherein:

a plurality of sets of content data are acquired by the system;

the means for selectively displaying further comprises means for scheduling the display of the image or images generated from the sets of content data;

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the control option enables the user to remove a set of content data from the schedule; and

the means for controlling removes the set of content data from the schedule.

9. A system as in claim 4, wherein:

a plurality of sets of content data are acquired by the system, at least one of the sets of content data capable of being occasionally updated;

the means for selectively displaying further comprises means for scheduling the display of the image or images generated from the sets of content data;

the control option enables the user to prevent the display of an image generated from a designated set of content data until the designated set of content data has been updated; and

the means for controlling prevents the display of the image generated from the designated set of content data until the designated set of content data has been updated.

10. A system as in claim 4, wherein:

a plurality of sets of content data are acquired by the system;

the means for selectively displaying further comprises means for scheduling the display of the image or images generated from the sets of content data;

the control option enables the user to specify a satisfaction level for a currently displayed image from a current set of content data; and

the means for controlling revises the schedule in response to the specified satisfaction level.

11. A system as in claim 4, wherein:

the control option enables the user to establish a link with an information location; and

the means for controlling establishes the link with the information location.

12. A method for engaging the peripheral attention of a person in the vicinity of a display device of an apparatus, comprising the steps of:

acquiring a set of content data from a content providing system;

detecting an idle period of predetermined duration; and

selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data, wherein the step of selectively displaying further comprises the step of displaying the image or images automatically after detection of the idle period.

13. A computer readable medium encoded with one or more computer programs for enabling acquisition of a set of content data and display of an image or images generated from the set of content data on a display device during operation of an attention manager, comprising:

acquisition instructions for enabling acquisition of a set of content data from a specified information source;

user interface installation instructions for enabling provision of a user interface that allows a person to request the set of content data from the specified information source;

content data scheduling instructions for providing temporal constraints on the display of the image or images generated from the set of content data, the content data scheduling instructions further comprising duration instructions for enabling specification of the duration of

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time that the image or images generated from a set of content data can be displayed, wherein the duration instructions specify a duration of time that is dependent upon the particular time at which the image or images generated from a set of content data are displayed after the attention manager begins operating; and

display instructions for enabling display of the image or images generated from the set of content data.

14. A computer readable medium encoded with one or more computer programs for enabling acquisition of a set of content data and display of an image or images generated from the set of content data on a display device during operation of an attention manager, comprising:

acquisition instructions for enabling acquisition of a set of content data from a specified information source;

user interface installation instructions for enabling provision of a user interface that allows a person to request the set of content data from the specified information source;

content data scheduling instructions for providing temporal constraints on the display of the image or images generated from the set of content data, the content data scheduling instructions further comprising duration instructions for enabling specification of the duration of time that the image or images generated from a set of content data can be displayed, wherein the duration instructions specify a duration of time that is dependent upon the number of previous times that the image or images have been displayed during a continuous operation of the attention manager; and

display instructions for enabling display of the image or images generated from the set of content data.

15. A computer readable medium encoded with one or more computer programs for enabling acquisition of a set of content data and display of an image or images generated from the set of content data on a display device during operation of an attention manager, comprising:

acquisition instructions for enabling acquisition of a set of content data from a specified information source;

user interface installation instructions for enabling provision of a user interface that allows a person to request the set of content data from the specified information source;

content data scheduling instructions for providing temporal constraints on the display of the image or images generated from the set of content data, wherein the content data scheduling instructions further comprise sequencing instructions that specify an order in which the images generated from a set of content data are displayed; and

display instructions for enabling display of the image or images generated from the set of content data.

16. A computer readable medium as in claim 15, wherein the sequencing instructions further specify the duration of the display of each image or images generated from each set of content data.

17. A computer readable medium encoded with one or more computer programs for enabling acquisition of a set of content data and display of an image or images generated from the set of content data on a display device during operation of an attention manager, comprising:



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acquisition instructions for enabling acquisition of a set of content data from a specified information source;  
 user interface installation instructions for enabling provision of a user interface that allows a person to request the set of content data from the specified information source;

content data scheduling instructions for providing temporal constraints on the display of the image or images generated from the set of content data, wherein the content data scheduling instructions further comprise saturation instructions that constrain the number of times that the image or images generated from a set of content data can be displayed; and

display instructions for enabling display of the image or images generated from the set of content data.

18. A computer readable medium, for use by a content display system, encoded with one or more computer programs for enabling acquisition of a set of content data and display of an image or images generated from the set of content data on a display device during operation of an attention manager, comprising:

acquisition instructions for enabling acquisition of a set of content data from a specified information source;  
 user interface installation instructions for enabling provision of a user interface that allows a person to request the set of content data from the specified information source;

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content data scheduling instructions for providing temporal constraints on the display of the image or images generated from the set of content data;

display instructions for enabling display of the image or images generated from the set of content data;

content data update instructions for enabling acquisition of an updated set of content data from an information source that corresponds to a previously acquired set of content data;

operating instructions for beginning, managing and terminating the display on the display device of an image generated from a set of content data;

content display system scheduling instructions for scheduling the display of the image or images on the display device;

installation instructions for installing the operating instructions and content display system scheduling instructions on the content display system; and

audit instructions for monitoring usage of the content display system to selectively display an image or images generated from a set of content data.

\* \* \* \* \*

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 6,034,652  
 DATED : March 7, 2000  
 INVENTOR(S) : Freiburger et al.

Page 1 of 3

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page,

Delete "Item [75] Inventors: Paul A. Freiburger, San Mateo, Calif.; Golan Levin, Staten Island, N.Y.; David P. Reed, Atherton, Calif.; Marc E. Davis, San Francisco, Calif.; Neal A. Bhadkamkar; Philippe P. Piernot, both of Palo Alto, Calif.; Todd A. Agulnick, San Francisco, Calif.; Sally N. Rosenthal, Palo Alto, Calif.; Giles N. Goodhead, Los Angeles, Calif."

and substitute

-- Item [75] Inventors: Paul A. Freiburger, San Mateo, Calif.; Philippe P. Piernot, Palo Alto, Calif.; Giles N. Goodhead, Los Angeles, Calif.; Neal A. Bhadkamkar, Palo Alto, Calif.; Todd A. Agulnick, San Francisco, Calif.; David P. Reed, Dover, Mass.; Golan Levin; Marc E. Davis, both of San Francisco, Calif.; Sally N. Rosenthal, Palo Alto, Calif.; --.

Delete "5,573,643 11/1996 Judson ..... 395/200.48"

and substitute

-- 5,572,643 11/1996 Judson ..... 395/200.48 --.

Column 5,

Line 65, delete "5 to 5C" and substitute -- 5A, 5B and 5C --;

Column 11,

Line 67, after "5B", insert --, 5C--;

Column 22,

Line 29, delete "Update Frequency" and substitute -- Update-Frequency --;  
 Line 34, delete "bookreview-1-al.gif" and substitute -- bookreview-1-al.gif --;

Column 24,

Line 59, delete "5A and 5B" and substitute -- 5A, 5B and 5C --;

Column 25,

Line 12, delete "5A and" and substitute -- 5A, 5B and 5C --;  
 Line 13, delete "5B";

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 6,034,652  
DATED : March 7, 2000  
INVENTOR(S) : Freiburger et al.

Page 2 of 3

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 28,

Line 2, delete "5A and 5B", substitute -- 5A, 5B and 5C --;  
Line 15, delete "5A and 5B", substitute -- 5A, 5B and 5C --;

Column 29,

Line 11, after "5B", insert --, 5C --;

Column 34,

Add the following claims:

19. A system as in Claim 2, further comprising means for non-volatilely storing the set of content data.
20. A system as in Claim 2, further comprising:  
means for indicating a time at which the means for selectively displaying is to begin display of the image or images; and  
means for activating the means for acquiring at the indicated time, such that the means for selectively displaying displays the image or images in real time as the set of content data is acquired by the means for acquiring.
21. A system as in Claim 2, wherein the means for selectively displaying further comprises means for scheduling the display of the image or images generated from a set of content data.
22. A system as in Claim 2, further comprising means for updating the set of content data.
23. A system as in Claim 22, wherein the means for updating operates without disrupting use of the apparatus by the user during the time that the means for updating is operating.
24. A system as in Claim 22, wherein the means for updating obtains the updated set of content data from the content providing system.
25. A system as in Claim 24, wherein the means for updating operates automatically, without intervention by the user.
26. A system as in Claim 24, wherein the means for updating further comprises:  
means for specifying the location of the content providing system; and  
means for specifying the time at which an updated set of content data is to be obtained from the content providing system.





(12) **EX PARTE REEXAMINATION CERTIFICATE** (9050th)  
**United States Patent**  
**Freiberger et al.**

(10) Number: **US 6,034,652 C1**(45) Certificate Issued: **Jun. 5, 2012**

(54) **ATTENTION MANAGER FOR OCCUPYING THE PERIPHERAL ATTENTION OF A PERSON IN THE VICINITY OF A DISPLAY DEVICE**

(75) Inventors: **Paul A. Freiberger**, San Mateo, CA (US); **Philippe P. Piernot**, Palo Alto, CA (US); **Giles N. Goodhead**, Los Angeles, CA (US); **Neal A. Bhadkamkar**, Palo Alto, CA (US); **Todd A. Agulnick**, San Francisco, CA (US); **David P. Reed**, Dover, MA (US); **Golan Levin**, San Francisco, CA (US); **Marc E. Davis**, San Francisco, CA (US); **Sally N. Rosenthal**, Palo Alto, CA (US)

(73) Assignee: **Interval Licensing LLC**, Seattle, WA (US)

**Reexamination Request:**

No. 90/011,576, Mar. 16, 2011

**Reexamination Certificate for:**

Patent No.: **6,034,652**  
 Issued: **Mar. 7, 2000**  
 Appl. No.: **08/620,641**  
 Filed: **Mar. 22, 1996**

Certificate of Correction issued Nov. 13, 2001.

(51) Int.Cl. **G09F 27/00** (2006.01)

(52) U.S. Cl. **715/730; 709/218**

(58) **Field of Classification Search** ..... None  
 See application file for complete search history.

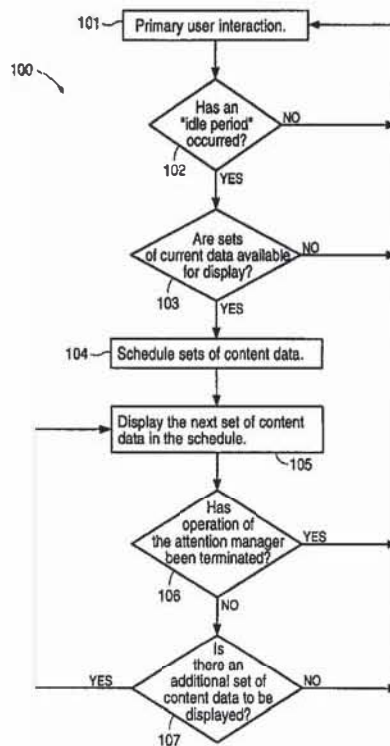
(56) **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/011,576, please refer to the USPTO's public Patent Application Information Retrieval (PAIR) system under the Display References tab.

*Primary Examiner*—Deandra Hughes

(57) **ABSTRACT**

An attention manager presents information to a person in the vicinity of a display device in a manner that engages at least the peripheral attention of the person. The information is embodied by one or more sets of content data (e.g., video or audio data). Each set of content data is formulated by a content provider and made available for use by content display systems. Upon appropriate activation, each content display system displays images corresponding to the sets of content data in accordance with predetermined scheduling information. The attention manager makes use of "unused capacity" of the display device and the person's attention, providing information to the person that the person might not otherwise expend adequate energy to obtain. The attention manager also affords an opportunity to content providers to disseminate their information to people that are interested in receiving such information, enabling the content providers to provide better directed information dissemination, as well as providing access to the previously unused attention capacity of those interested people.



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**EX PARTE**  
**REEXAMINATION CERTIFICATE**  
**ISSUED UNDER 35 U.S.C. 307**

THE PATENT IS HEREBY AMENDED AS  
INDICATED BELOW.

**Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 4-8, 11 and 15-18 is confirmed.

New claims 34-67 are added and determined to be patentable.

Claims 1-3, 9-10, 12-14 and 19-33 were not reexamined.

34. A system as in claim 4, wherein:

*the means for selectively displaying said image or images generated from the set of content data in an unobtrusive manner enables said image or images to be displayed during an active period of the primary interaction with the display device or apparatus.*

35. A system as in claim 34, wherein:

*the means for selectively displaying said image or images generated from the set of content data in an unobtrusive manner enables said image or images to be displayed in an area of the display device that is not used by the primary interaction.*

36. A system as in claim 11, wherein:

*the link comprises a Universal Resource Locator (URL) of the information location.*

37. A system as in claim 11, wherein:

*the means for controlling uses the established link to retrieve information from the information location, wherein the information is related to the selective display of the image or images generated from the set of content data.*

38. The computer readable medium of claim 15, wherein the user interface installation instructions enable provision of the user interface on each of a plurality of user computers.

39. The computer readable medium of claim 15, wherein the user interface provided by the user interface installation instructions enables the person, during display of the image or images generated from the set of content data, to request information from another specified information source.

40. The computer readable medium of claim 39, wherein the requested information is another set of content data.

41. The computer readable medium of claim 17, wherein the user interface installation instructions enable provision of the user interface on each of a plurality of user computers.

42. The computer readable medium of claim 17, wherein the user interface provided by the user interface installation instructions enables the person, during display of the image or images generated from the set of content data, to request information from another specified information source.

43. The computer readable medium of claim 42, wherein the requested information is another set of content data.

44. The computer readable medium of claim 18, wherein the user interface installation instructions enable provision of the user interface on each of a plurality of user computers.

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45. The computer readable medium of claim 18, wherein the user interface provided by the user interface installation instructions enables the person, during display of the image or images generated from the set of content data, to request information from another specified information source.

46. The computer readable medium of claim 45, wherein the requested information is another set of content data.

47. The computer readable medium of claim 15, wherein the user interface provided by the user interface installation instructions enables the person to indicate interest in particular information provided by a specified information source.

48. The computer readable medium of claim 47, wherein the particular information is a particular set of content data.

49. The computer readable medium of claim 17, wherein the user interface provided by the user interface installation instructions enables the person to indicate interest in particular information provided by a specified information source.

50. The computer readable medium of claim 49, wherein the particular information is a particular set of content data.

51. The computer readable medium of claim 18, wherein the user interface provided by the user interface installation instructions enables the person to indicate interest in particular information provided by a specified information source.

52. The computer readable medium of claim 51, wherein the particular information is a particular set of content data.

53. The computer readable medium of claim 15, wherein the user interface provided by the user interface installation instructions further enables the person to directly request a particular set of content data from one of a plurality of information sources.

54. The computer readable medium of claim 15, wherein the user interface provided by the user interface installation instructions further enables the person to select a particular information source from which to request a set of content data.

55. The computer readable medium of claim 15, wherein the user interface provided by the user interface installation instructions further enables the person to select a control option that enables the user to establish a link with an information location.

56. The computer readable medium of claim 55, wherein the link comprises a Universal Resource Locator (URL) of the information location.

57. The computer readable medium of claim 55, wherein the acquisition instructions further enable acquisition of the set of content data from the information location.

58. The computer readable medium of claim 17, wherein the user interface provided by the user interface installation instructions further enables the person to directly request a particular set of content data from one of a plurality of information sources.

59. The computer readable medium of claim 17, wherein the user interface provided by the user interface installation instructions further enables the person to select a particular information source from which to request a set of content data.

60. The computer readable medium of claim 17, wherein the user interface provided by the user interface installation instructions further enables the person to select a control option that enables the user to establish a link with an information location.

61. The computer readable medium of claim 60, wherein the link comprises a Universal Resource Locator (URL) of the information location.

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62. The computer readable medium of claim 60, wherein the acquisition instructions further enable acquisition of the set of content data from the information location.

63. The computer readable medium of claim 18, wherein the user interface provided by the user interface installation instructions further enables the person to directly request a particular set of content data from one of a plurality of information sources.

64. The computer readable medium of claim 18, wherein the user interface provided by the user interface installation instructions further enables the person to select a particular information source from which to request a set of content data.

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65. The computer readable medium of claim 18, wherein the user interface provided by the user interface installation instructions further enables the person to select a control option that enables the user to establish a link with an information location.

66. The computer readable medium of claim 65, wherein the link comprises a Universal Resource Locator (URL) of the information location.

67. The computer readable medium of claim 65, wherein the acquisition instructions further enable acquisition of the set of content data from the information location.

\* \* \* \* \*

(12) **United States Patent**  
**Freiberger et al.**

(10) **Patent No.:** **US 6,788,314 B1**  
 (45) **Date of Patent:** **\*Sep. 7, 2004**

(54) **ATTENTION MANAGER FOR OCCUPYING THE PERIPHERAL ATTENTION OF A PERSON IN THE VICINITY OF A DISPLAY DEVICE**

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 5,305,195 4/1994 Murphy ..... 364/401  
 5,347,632 9/1994 Filepp et al. .... 395/200  
 5,436,637 \* 7/1995 Gayraud et al. .... 345/705

(75) **Inventors:** **Paul A. Freiberger**, San Mateo, CA (US); **Golan Levin**, San Francisco, CA (US); **David P. Reed**, Dover, MA (US); **Marc E. Davis**, San Francisco, CA (US); **Neal A. Bhadkamkar**, Palo Alto, CA (US); **Philippe P. Piernot**, Palo Alto, CA (US); **Todd A. Aquilnick**, San Francisco, CA (US); **Sally N. Rosenthal**, Palo Alto, CA (US); **Giles N. Goodhead**, Los Angeles, CA (US)

(List continued on next page.)

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Rigdon, Joan E., "Screen Savers Go Beyond Fish, Flying Toasters", Wall Street Journal, Feb. 13, 1996.

(73) **Assignee:** **Interval Research Corporation**, Palo Alto, CA (US)

(\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

*Primary Examiner*—Jeffery Brier

(74) *Attorney, Agent, or Firm*—Van Pelt & Yi LLP

(57)

**ABSTRACT**

An attention manager presents information to a person in the vicinity of a display device in a manner that engages at least the peripheral attention of the person. The information is embodied by one or more sets of content data (e.g., video or audio data). Each set of content data is formulated by a content provider and made available for use by content display systems. Upon appropriate activation, each content display system displays images corresponding to the sets of content data in accordance with predetermined scheduling information. The attention manager makes use of "unused capacity" of the display device and the person's attention, providing information to the person that the person might not otherwise expend adequate energy to obtain. The attention manager also affords an opportunity to content providers to disseminate their information to people that are interested in receiving such information, enabling the content providers to provide better directed information dissemination, as well as providing access to the previously unused attention capacity of those interested users.

This patent is subject to a terminal disclaimer.

(21) **Appl. No.:** **09/528,803**

(22) **Filed:** **Mar. 20, 2000**

**Related U.S. Application Data**

(63) Continuation of application No. 09/372,399, filed on Aug. 10, 1999, now abandoned, which is a continuation of application No. 08/620,641, filed on Mar. 22, 1996, now Pat. No. 6,034,652.

(51) **Int. Cl.**<sup>7</sup> ..... **G09G 5/12; G09G 5/14; G06F 15/16**

(52) **U.S. Cl.** ..... **345/730; 709/218**

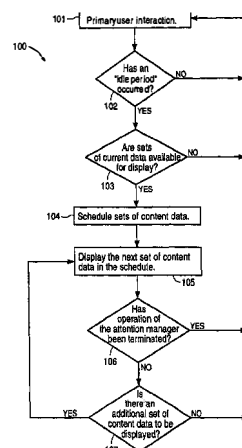
(58) **Field of Search** ..... **345/2.1, 705, 710, 345/730; 707/10, 104, 501; 709/217, 218, 219**

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**15 Claims, 8 Drawing Sheets**



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| 5,572,643             | 11/1996   | Judson .....       | 395/793 | 5,913,040 | 6/1999              | Rakavy et al. ....     | 395/200.62 |
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\* cited by examiner

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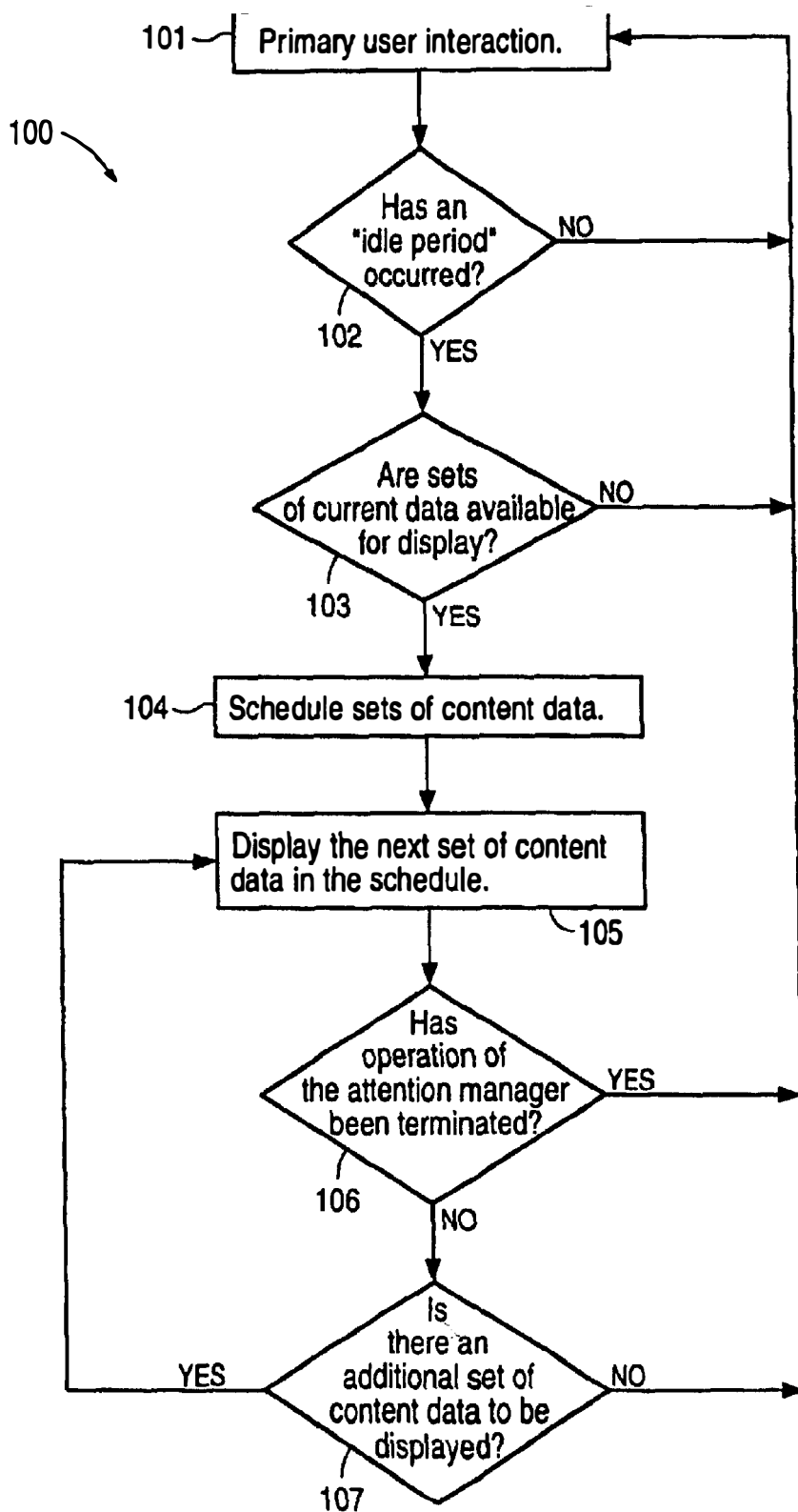


FIG. 1

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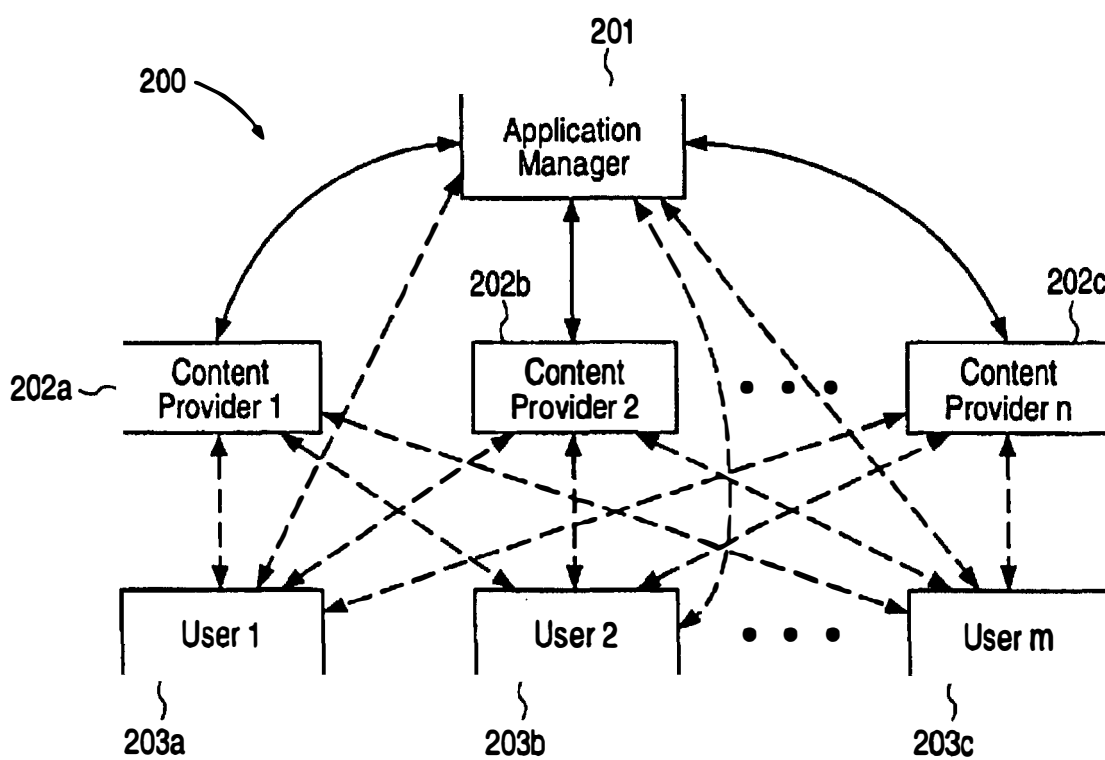


FIG. 2



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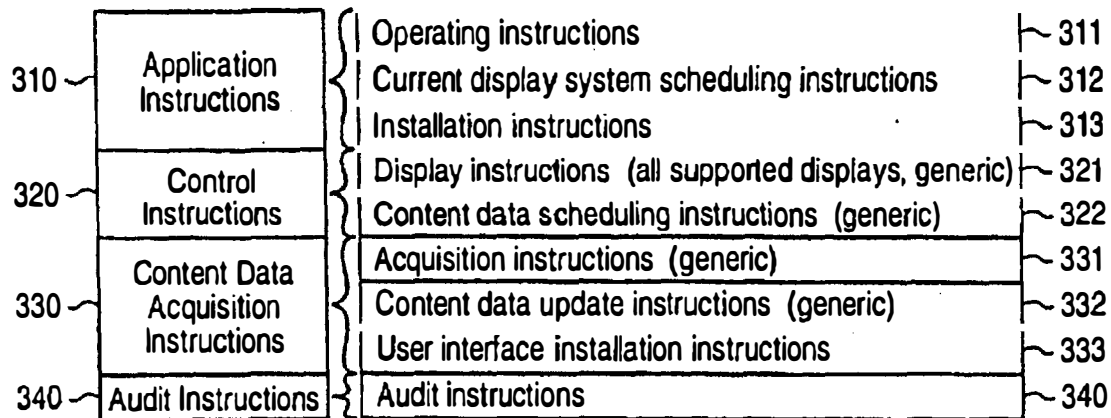


FIG. 3A

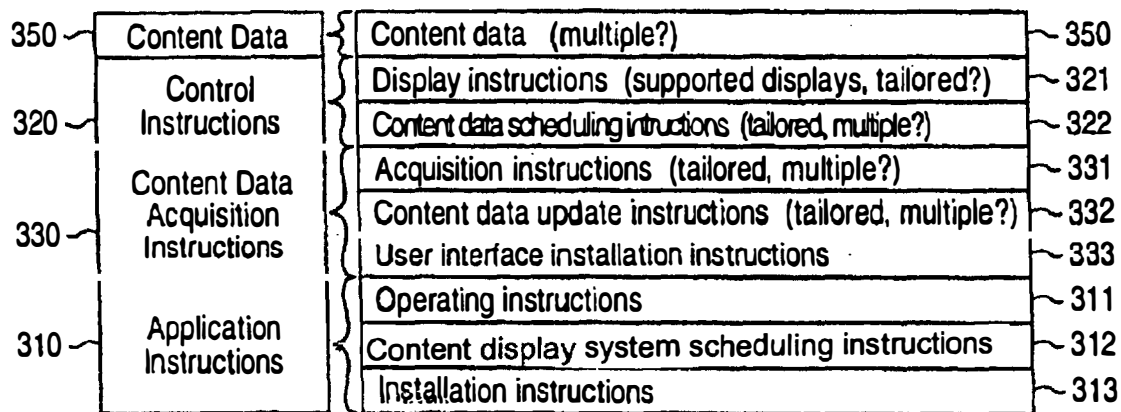


FIG. 3B

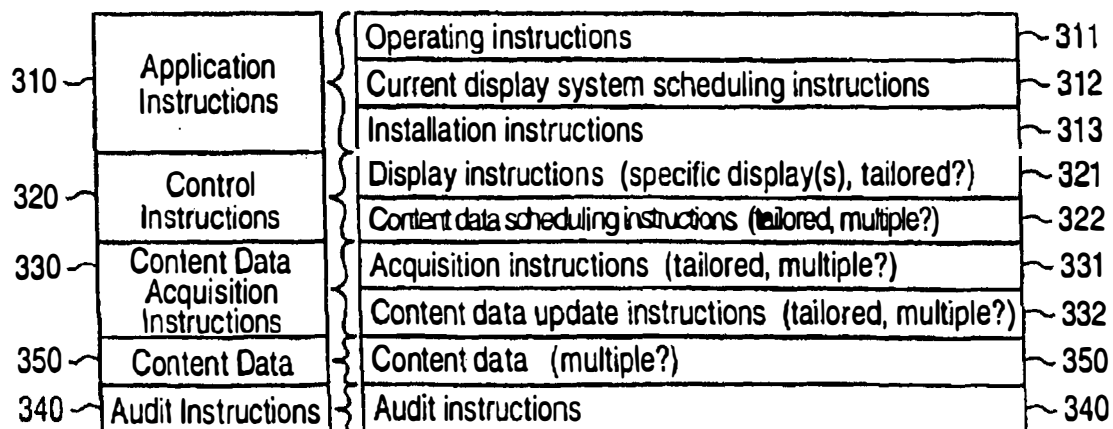


FIG. 3C

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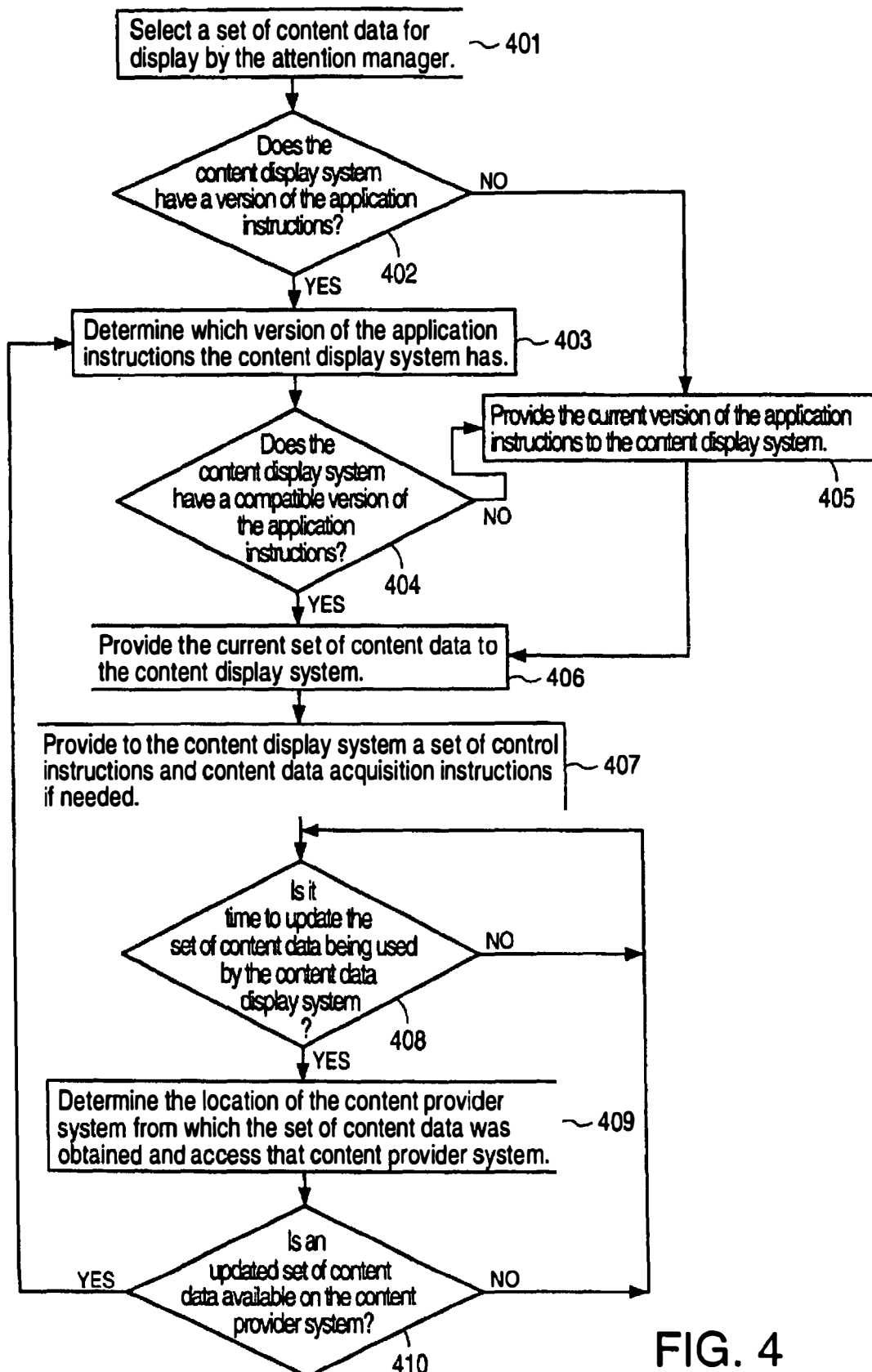


FIG. 4

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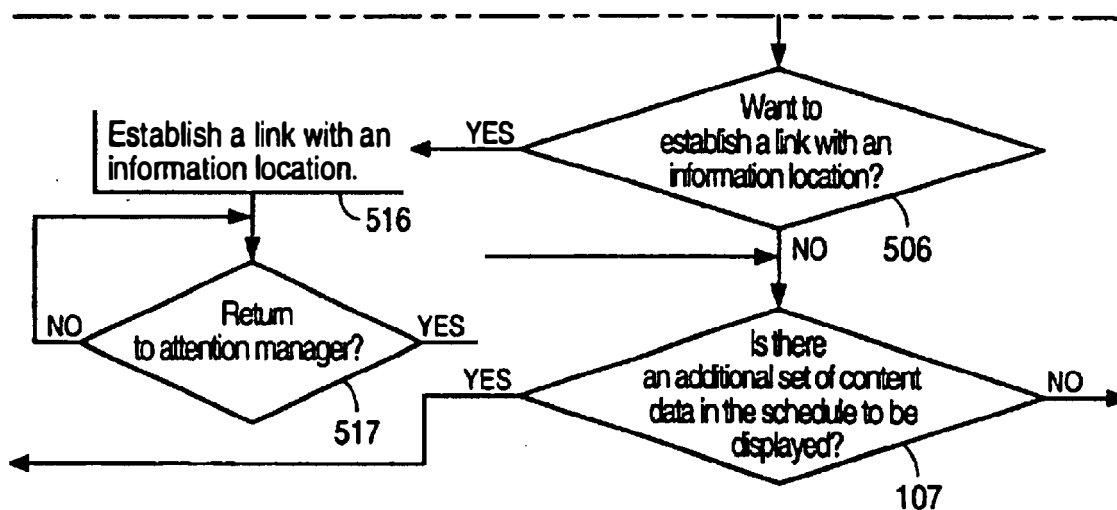


FIG. 5C

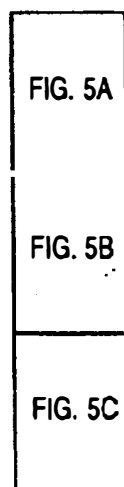


FIG. 5

FIG. 5A

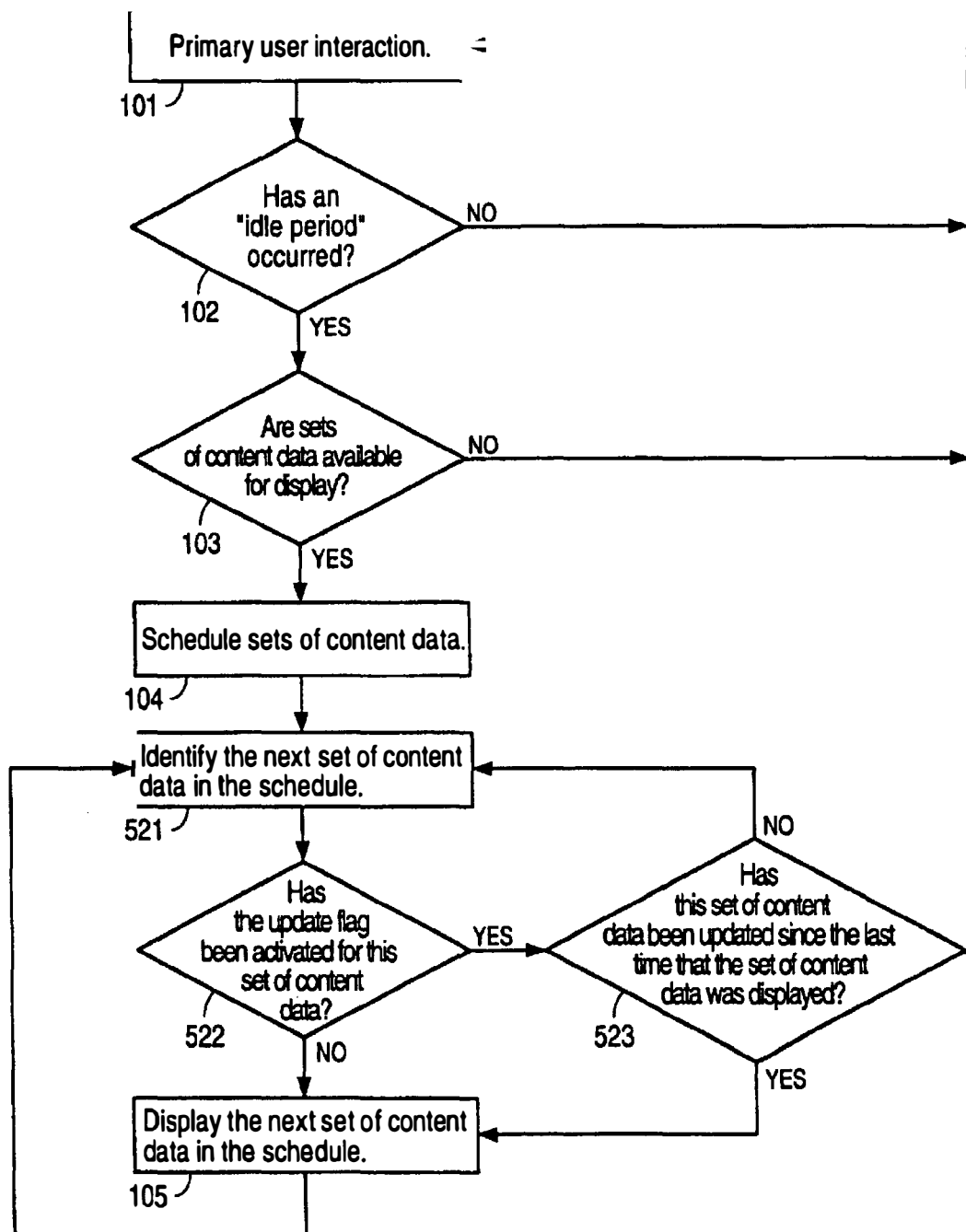
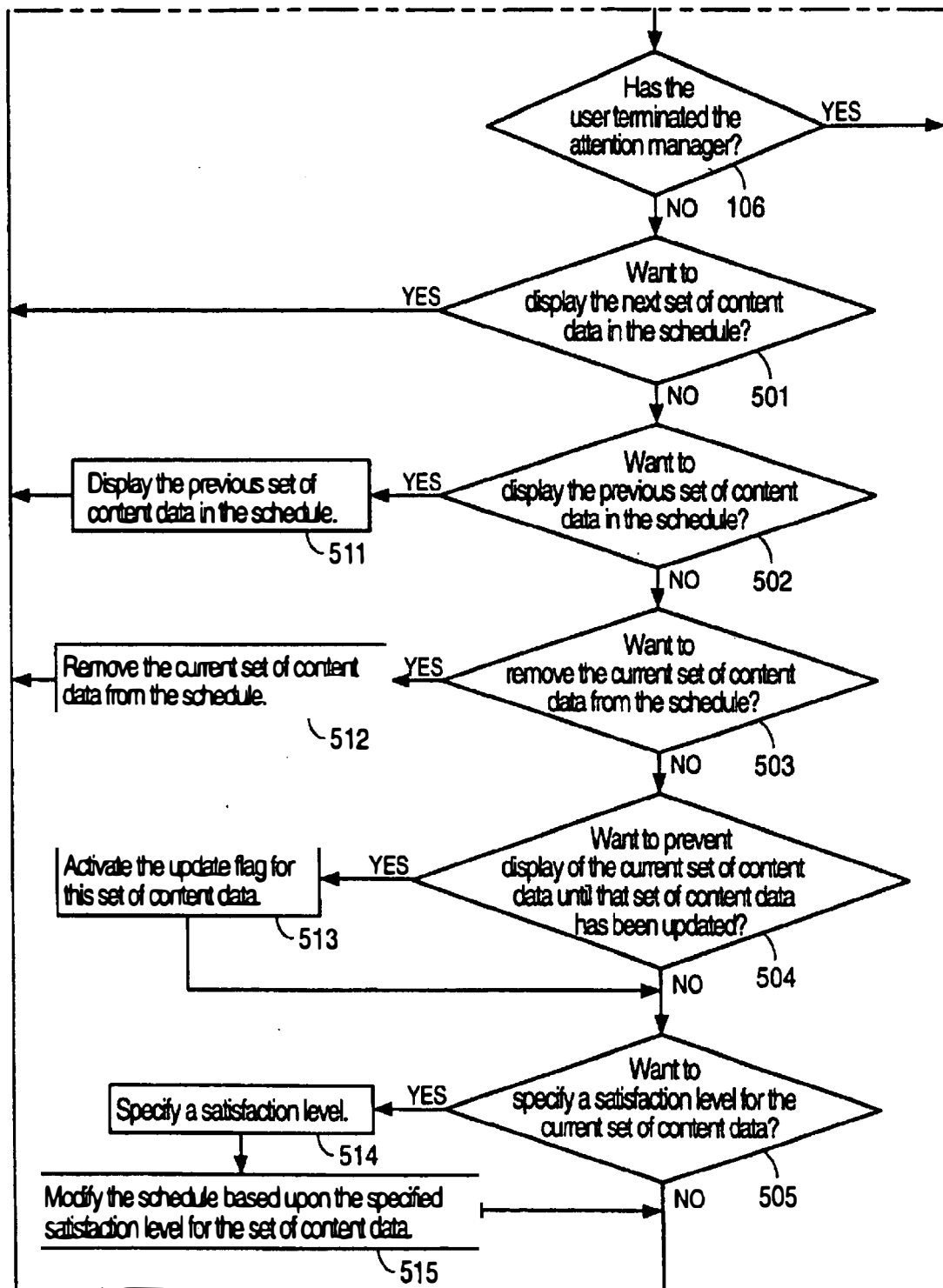


FIG. 5B



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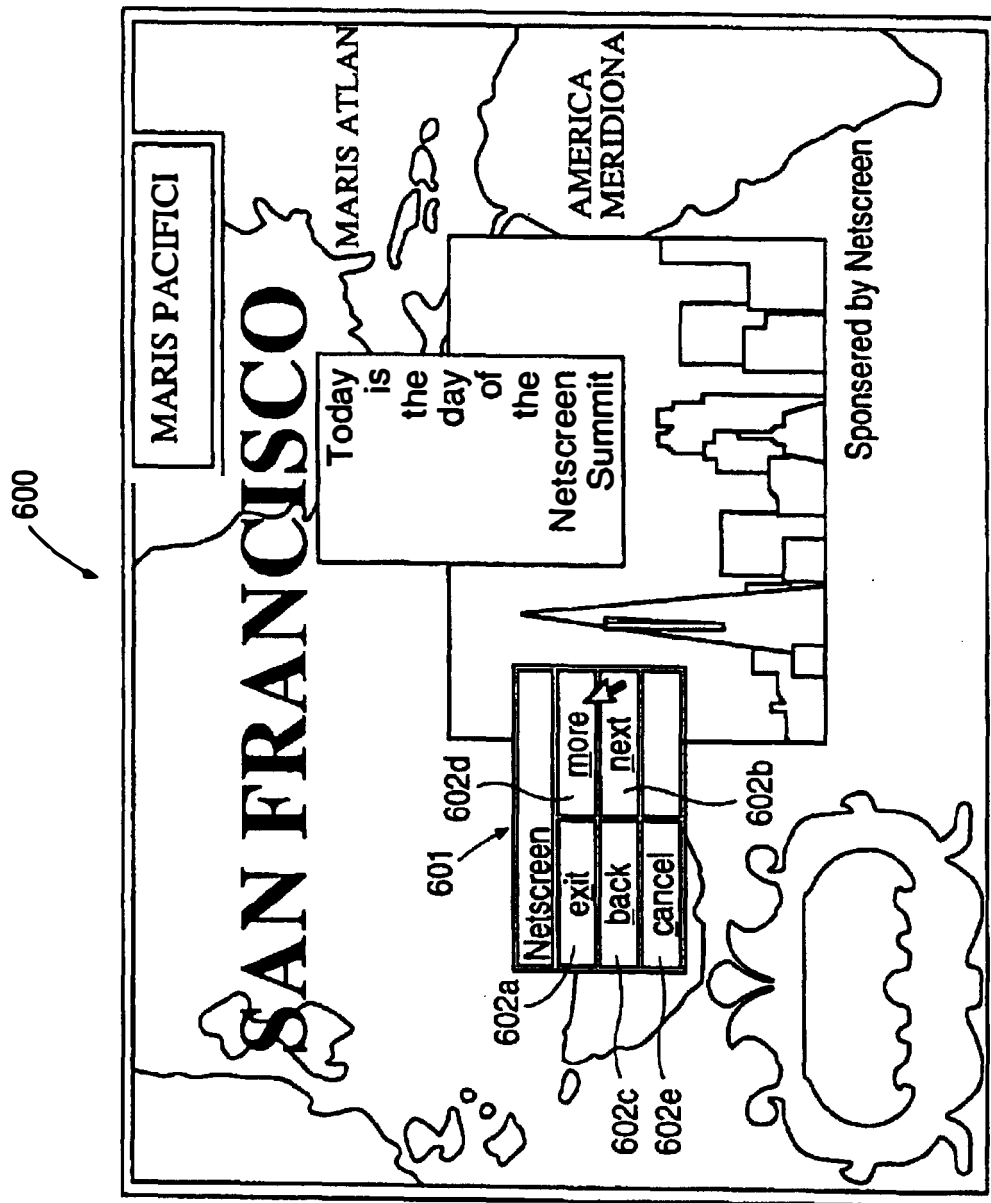


FIG. 6

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# ATTENTION MANAGER FOR OCCUPYING THE PERIPHERAL ATTENTION OF A PERSON IN THE VICINITY OF A DISPLAY DEVICE

This application is a continuation of U.S. patent application Ser. No. 09/372,399, entitled ATTENTION MANAGER FOR OCCUPYING THE PERIPHERAL ATTENTION OF A PERSON IN THE VICINITY OF A DISPLAY DEVICE, filed Aug. 10, 1999, now abandoned, which is a continuation of U.S. patent application Ser. No. 08/620,641, filed Mar. 22, 1996, now U.S. Pat. No. 6,034,652.

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

This invention relates to the engagement of the peripheral attention of a person in the vicinity of a display device such as the display monitor of a computer.

### 2. Related Art

Information providers of all sorts have an interest in presenting their information to information consumers and, in particular, to information consumers who may, or do, have an interest in the particular information provided by the particular information provider. At the same time, information consumers have an interest in accessing a wide variety of information and, in particular, information in which the information consumer may, or does have an interest. Given the extent to which computers now permeate society, and particularly in view of the escalation of networking of those computers in various ways, there is increasing recognition of the capability of using computers, and, in particular, computers (and other devices) that are interconnected in a network, as an information dissemination tool that can satisfy the interests of both information providers and information consumers.

For example, information providers have used public computer networks (e.g., the Internet) and private computer networks (e.g., commercial online services such as America Online, Prodigy and CompuServe) to disseminate their information. This information can be displayed to a computer user having access to the network directly in response to a request from the user or indirectly (i.e., without request by the user) as a result of another action taken by the user. While these methods of information dissemination and acquisition can be effective, they do not exhaust the possibilities.

In a different vein, historically, computers have frequently included screen saving mechanisms ("screen savers") intended to prevent the phosphors of a computer display screen from burning out when the same image remains on the screen for a long period of time, such as might occur during a long period of inactivity while the computer is operating. As computer display screen technology has progressed, the use of screen savers to preserve the display screen has become increasingly unnecessary. However, the use of screen savers has continued—even proliferated—likely due to the aesthetic or entertainment value provided by the imagery of many screen savers. Further, the use of "wallpaper" (i.e., a pattern generated in the background portions on a computer display screen) in computer display screens has also arisen, largely one would suspect because of the aesthetic or entertainment value of the wallpaper imagery. While the use of screen savers and wallpaper with computer displays appeals to many users because of the imagery they present to the user, screen savers and wallpaper have not heretofore been used as a means to convey infor-

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mation from information providers to computer users. Further, screen savers and wallpaper have previously been implemented as relatively simple, self-contained computer application programs that are not typically integrated with other application programs or other aspects of computer operation. In particular, screen saver and wallpaper application programs have not been constructed to enable retrieval of display content from a remote location via a computer network.

## SUMMARY OF THE INVENTION

An attention manager according to the invention presents information to a person in the vicinity of a display device in a manner that engages the peripheral attention of the person. Often, the display device is part of a broader apparatus (e.g., the display device of a computer). Generally, the attention manager makes use of "unused capacity" of the display device. For example, the information can be presented to the person while the apparatus (e.g., computer) is operating, but during inactive periods (i.e., when a user is not engaged in an intensive interaction with the apparatus). Or, the information can be presented to the person during active periods (i.e., when a user is engaged in an intensive interaction with the apparatus), but in an unobtrusive manner that does not distract the user from the primary interaction with the apparatus (e.g., the information is presented in areas of a display screen that are not used by displayed information associated with the primary interaction with the apparatus).

The information is embodied as one or more sets of content data. The sets of content data represent sensory data; typically, the sensory data is either video or audio data. Each set of content data is formulated by a content provider and made available for use by an attention manager according to the invention. Each content providing system can provide more than one set of content data. The content providing systems provide user interface tools that enable a particular set of content data to be requested. Once one or more sets of content data has been acquired, a content display system integrates scheduling information for all sets of content data to produce a schedule according to which an image or images corresponding to the sets of content data are displayed on a display device associated with the content display system.

A set or sets of instructions for enabling a display device to selectively display an image or images generated from a set of content data are also made available for use by the content display systems. Typically, the instructions enable images generated from content data to be displayed automatically, without user intervention, in a predetermined manner, thereby enhancing the capability of the invention to occupy the user's peripheral attention. Further, the attention manager can be implemented so that the instructions are automatically acquired (or updated, if necessary) each time a user requests acquisition of a set of content data, thereby making acquisition of the instructions transparent to the user of the attention manager and thus increasing the ease of use for the user. The instructions can include application instructions, control instructions and content data acquisition instructions. The application instructions can include operating instructions for beginning, managing, and terminating operation of the attention manager on a content display system, content display system scheduling instructions for scheduling the display of content data on a content display system, and installation instructions for installing the operating instructions and content display system scheduling instructions on a content display system. The control instructions can include display instructions for enabling

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generation of images from the content data on a particular type of display device or from a particular type of content data, and content data scheduling instructions for enabling temporal control of the display of the images generated from a set or sets of content data. The content data acquisition instructions can include acquisition instructions for enabling the acquisition of a set of content data, content data update instructions for enabling update of a previously acquired set of content data, and user interface installation instructions for enabling provision of a user interface that allows a person to request a set of content data from a content providing system. Each of the application, control and content data acquisition instructions could be acquired from a content provider, or any one or all of the sets of instructions could be acquired from an application manager that provides generic sets of instructions that can be tailored as necessary or desirable by a content provider. Additionally, audit instructions can be made available that enable monitoring of usage of the attention manager.

According to one aspect of the invention, an attention manager engages the peripheral attention of a person in the vicinity of a display device of an apparatus by acquiring one or more sets of content data from a content providing system and selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the apparatus from a primary interaction with the apparatus, an image or images generated from the set of content data. According to a further aspect of the invention, the selective display of the image or images begins automatically after detection of an idle period of predetermined duration (the "screen saver embodiment"). This aspect can be implemented, for example, using the screen saver API (application program interface) that is part of many operating systems. According to another further aspect of the invention, the selective display of an image or images occurs while the user is engaged in a primary interaction with the apparatus, which primary interaction can result in the display of an image or images in addition to the image or images generated from the set of content data (the "wallpaper embodiment"). If multitasking is allowed by the apparatus (e.g., by the computer operating system) with which the attention manager is used, the attention manager can be implemented so that, when operation of the attention manager is terminated, the user is returned to the state of the primary interaction that existed when operation of the attention manager began. The attention manager can also be implemented so that, during operation of the attention manager, the user is presented with a number of options regarding further use of the attention manager. In particular, one of the options can allow additional information to be obtained that is related to the set of content data for which an image is being displayed. Where the attention manager is implemented as part of a network, this option can enable information to be obtained from a remote information source via the network. Another option that can be implemented allows a user to specify a satisfaction level for a set of content data from which an image or images is being displayed, thereby affecting the frequency with which that set of content data is used by the attention manager in the future.

According to another aspect of the invention, an attention manager that engages the peripheral attention of a person in the vicinity of a display device includes a content display system associated with the display device, a mechanism that can communicate with the content display system via a first communications mechanism to provide to the content display system a set of instructions for enabling the display

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device to selectively display content data, and a content providing system that can communicate with the content display device via a second communications mechanism to provide a set of content data to the content display system. The content display system uses the provided set of instructions to selectively display on the display device an image or images generated from the provided content data. The attention manager according to this aspect of the invention can further include an application management system that can communicate via a third communications mechanism to provide to either the content providing system or the content display system one or more sets of instructions for enabling a display device to selectively display an image or images generated from a set of content data. In the former case, the content providing system can, in turn, communicate with the content display system to provide the one or more sets of instructions. The attention manager according to this aspect of the invention can be implemented, for example, using existing computer networks of information sources, such as the Internet (in particular, the World Wide Web) or commercial online services, advantageously making use of pre-existing hardware and software for enabling communication over those networks. Typically, though not necessarily, an attention manager according to this aspect of the invention will include multiple content display systems and multiple content providing systems. The content providing systems will each be capable of providing one or more sets of content data, so that, overall, there will be multiple available sets of content data which can be of different types. There can also be multiple sets of instructions for enabling a display device to selectively display an image or images generated from a set of content data, which sets of instructions may be tailored to display images from particular types of content data or to display content data using a particular display device.

According to yet another aspect of the invention, a computer readable medium can be encoded with one or more computer programs for enabling acquisition of a set of content data and display of an image or images generated from the set of content data on a display device during operation of an attention manager. The instructions of the computer program can include: i) acquisition instructions for enabling acquisition of a set of content data from a specified information source, ii) user interface installation instructions for enabling provision of a user interface that allows a person to request the set of content data from the specified information source, iii) content data scheduling instructions for providing temporal constraints on the display of the image or images generated from the set of content data, and iv) display instructions for enabling display of the image or images generated from the set of content data. The computer readable medium can also further include content data update instructions for enabling acquisition of an updated set of content data from an information source that corresponds to a previously acquired set of content data, the content data update instructions specifying where and when to obtain the updated set of content data. The content data scheduling instructions can specify, for example, the duration of time that the image or images generated from a set of content data can be displayed, an order in which the images generated from a plurality of sets of content data are displayed, a time or times at which the image or images generated from a set of content data can or cannot be displayed, and/or constraint on the number of times that the image or images generated from a set of content data can be displayed. The display instructions can be tailored to enable display of the image or images generated from a set of content data on a display device of a particular type, or display of an image or images generated from a set of content data of a particular type.

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According to still another aspect of the invention, a computer readable medium can be encoded with one or more computer programs for enabling a content display system to selectively display on a display device, in an unobtrusive manner that does not distract a person from a primary interaction with an apparatus associated with the display device, an image generated from a set of content data. The instructions of the computer program can include: i) operating instructions for beginning, managing and terminating the selective display of the image on the display device, ii) content display system scheduling instructions for scheduling the display of the image on the display device, and iii) installation instructions for installing the operating instructions and content display system scheduling instructions on a content display system. The computer readable medium can also further include audit instructions for monitoring usage of the content display system to selectively display an image generated from a set of content data.

The attention manager according to the invention is a new and useful mechanism for providing information to users of the attention manager. The attention manager provides information in which a user has expressed an interest and, importantly, information that the user might not otherwise expend adequate energy to obtain. The user can tailor the information provided by interacting with specific information sources to indicate interest in particular information provided by a specific information source while the user is perusing other information from that information source (as opposed to giving a general indication of interest in information on a particular subject or of a particular kind, from which indication information that matches the indicated interest is automatically provided from various information sources). The user can also choose information from a wide variety of information sources; in particular, when the attention manager is implemented using a network (e.g., the Internet), the user can acquire information from a wide variety of remote information sources. Additionally, the information is presented to the user in a manner that uses portions of the user's attention capacity that may otherwise be unused or filled with extraneous information.

The attention manager according to the invention also provides a new and useful information dissemination tool to content providers. The attention manager affords an opportunity to content providers to disseminate their information to users that are interested in receiving such information, enabling the content providers to provide better directed information dissemination. Moreover, the attention manager provides access to the previously unused attention capacity of those interested users. Additionally, the attention manager allows content providers to tailor particular aspects of the attention manager as desired by the content provider, such as the acquisition of updated sets of the content provider's content data (e.g., the frequency of such updates), the display scheduling and manner of display of the content provider's content data, and the user interface that enables users to specify acquisition of the content provider's content data.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a flow chart of a method that implements an attention manager according to an embodiment of the invention.

FIG. 2 is a block diagram of a system for implementing an attention manager according to an embodiment of the invention.

FIGS. 3A, 3B and 3C are schematic diagrams illustrating the functional components of an application manager, a

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content providing system and a content display system, respectively, according to an embodiment of the invention.

FIG. 4 is a flow chart of a method, according to an embodiment of the invention, for acquiring and updating sets of content data.

FIGS. 5, 5A, 5B and 5C together are a flow chart of a method that implements an attention manager according to another embodiment of the invention.

FIG. 6 illustrates a computer display screen including a user interface, according to one embodiment of the invention, that can be used to enable a user to specify a control option.

#### DETAILED DESCRIPTION OF THE INVENTION

According to the invention, an attention manager presents information to a person in the vicinity of a display device (or devices) in a manner that engages at least the peripheral attention of the person. "Display device", as used herein, encompasses any device that presents sensory stimulus to the person and includes, for example, computer video display devices, televisions and audio speakers. Further, here, "in the vicinity of" means any location with respect to the display device from which the person can perceive the information being presented. For example, if the information is being presented in a visual form, then "in the vicinity of" means any location from which the person can see the information. Or, if the information is being presented in an aural form, then "in the vicinity of" means any location from which the person can hear the information.

Often, the display device is part of a broader apparatus that can be utilized by a user for a primary interaction that is unrelated to the attention manager. (However, the attention manager can also be used with a display device that is not part of a broader apparatus, the user engaging in a primary interaction with the display device.) For example, the display device can be part of a computer that can be used to implement any of a number of application programs (e.g., word processing programs, computer games, spreadsheets, etc.). The person whose attention is engaged by the attention manager can be the user or another person in the vicinity of the display device. In one embodiment of the invention, the information is presented by the attention manager while a primary interaction is ongoing, but during inactive periods (i.e., when the user is not engaged in an intensive interaction with the apparatus). In another embodiment of the invention, the information is presented by the attention manager during active periods (i.e., when the user is engaged in an intensive interaction with the apparatus), but in an unobtrusive manner that does not distract the user from the primary interaction (e.g., the information is presented in areas of a display screen that are not used by displayed information associated with the primary interaction). Generally, then, an attention manager according to the invention makes use of "unused capacity" of a display device, "unused capacity" being defined broadly to include, for example, the embodiments mentioned above, i.e., both temporal (e.g., the first-described embodiment above) and spatial (e.g., the second-described embodiment above) dimensions.

The information is embodied by one or more sets of content data. Each set of content data is formulated by a content provider and made available by a corresponding content providing system for use with the attention manager. Each content providing system can provide more than one set of content data. Moreover, each set of content data can include one or more "clips", each clip being a definable

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portion of the set of content data that is used to generate a particular "image." The term "image" is used broadly here to mean any sensory stimulus that is produced from the set of content data, including, for example, visual imagery (e.g., moving or still pictures, text, or numerical information) and audio imagery (i.e., sounds). The content providing systems can also provide user interface tools that allow a user of the attention manager to specify that they want to obtain a particular set of content data. Once obtained, one or more images generated from the clips of one or more sets of content data are displayed by a content display system. The content display system integrates scheduling information associated with the sets of content data to produce a schedule according to which the images corresponding to the sets of content data are displayed for a particular user of the attention manager.

A set or sets of instructions for enabling a display device to selectively display images generated from one or more sets of content data are also made available to users of the attention manager. The instructions include application instructions, control instructions and content data acquisition instructions. Typically, the instructions enable images generated from content data to be displayed automatically, without user intervention, in a predetermined manner, thereby enhancing the capability of the attention manager to occupy the user's peripheral attention. Different sets of instructions can be formulated, such that only images generated from sets of content data that are compatible with a particular set of instructions can be displayed using that set of instructions. Typically, an application manager establishes a standard set or sets of instructions which content providers can tailor to fit their needs or desires.

As indicated above, the sets of content data represent sensory data, i.e., data that can be used to generate images as defined above. Typically, the sensory data is either video or audio data. The kinds of content data that can be used with the attention manager are virtually limitless. For example, video data that might be used as content data includes data that can be used to generate advertisements of interest to the user, moving and still video images which can be real-time or pre-recorded (e.g., nature scenes, pictures of family members, MTV music segments, or video from a camera monitoring a specified location, such as ski slopes or a traffic intersection, for conditions at that location), financial data (e.g., stock ticker information) or news summaries. Audio data that might be used as content data includes data that can be used to generate, for example, music or news programs (e.g., radio talk shows).

The attention manager according to the invention is useful both to users of the attention manager and to content providers. For users, the attention manager provides information to a user in which the user has expressed an interest. In particular, the attention manager provides information to a user that the user might not otherwise expend adequate energy to obtain. Additionally, the information is presented to the user in a manner that uses portions of the user's attention capacity that may otherwise be filled with extraneous information. Further, a variety of information can be displayed (i.e., images can be generated from more than one set of content data), so that the user does not have to choose particular information to the exclusion of all other information.

For content providers, the attention manager affords an opportunity to disseminate information to users that are interested in receiving such information, thus enabling the content providers to provide better directed information dissemination. Moreover, the attention manager provides

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access to the previously unused attention capacity of those interested users. Further, since information from more than one content provider can be displayed, content providers are more likely to have their information displayed, since their information is displayed in addition to, rather than instead of, the information of other content providers, thereby reducing the need to compete with other content providers for the attention of the user.

FIG. 1 is a flow chart of a method 100 that implements an attention manager according to an embodiment of the invention. The method 100 is performed by a content display system according to the invention. The content display system can be implemented, for example, using a digital computer that includes a display device and that is programmed to perform the functions of the method 100, as described below. Below, the method 100 is described as implemented on such a digital computer, though the method 100 could be implemented on other apparatus.

As shown by block 101, initially (i.e., before operation of the attention manager begins), a user is engaged in a primary user interaction, e.g., a primary user interaction with a computer. Though shown in FIG. 1, the primary user interaction of block 101 does not form part of the method 100 according to the invention. "Primary user interaction" is to be construed broadly and, generally, includes any operation of the computer (or other apparatus with which the user is engaging in an interaction) other than operation that is part of the attention manager according to the invention. When the user is interacting with a computer, the primary user interaction includes any operation of the computer that occurs to enable or to support the performance of the function or functions that provide the basis for the user's use of the computer. For example, the primary user interaction can be the use of any of a variety of conventional application programs (e.g., word processing programs, spreadsheet programs, personal finance programs, game programs, drawing programs, online services and Web browsers, among others). The primary user interaction can also be, for example, simply the operation of a conventional computer operating system, such as the Windows (e.g., Windows 3.1, Windows NT or Windows 95) or DOS operating systems produced by Microsoft Corp. of Redmond, Wash. or the Macintosh operating system produced by Apple Computer, Inc. of Cupertino, Calif., among others. While, typically, the display device produces a display as a result of the primary user interaction, this need not necessarily be the case.

The method 100 actually begins with the block 102. In the step shown in the block 102 (referred to hereinafter as step 102), a determination is made as to whether an "idle period" has occurred. Generally, as used herein, "idle period" refers to a period of time of specified duration during which a specified condition does not occur. However, typically, the specified condition is one having the characteristic that failure of the condition to occur is indicative of an extended lack of intensive (or focused) interaction with the computer by the user ("user inactivity"). For example, the specified condition could be the lack of an input from an input device of the computer, e.g., the absence of striking a key on a keyboard, clicking a mouse, pressing on a touch-sensitive area of a touchscreen or issuing a voice command. Alternatively, the attention manager could be implemented with an apparatus that can monitor the environment of the apparatus (e.g., with a video camera) and evaluate the environment to ascertain that an "idle condition" (e.g., the viewing direction of the user of the apparatus is turned away from the apparatus by a specified amount for a specified period of time) has occurred, such idle condition triggering operation of the attention manager.

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Theoretically, any duration of time can be specified to define the idle period. However, practically, the duration of time necessary to constitute an idle period cannot be so short that the attention manager begins operating at times that inhibit the user's primary interaction with the computer or that distract or annoy the user. Further, the duration of time chosen, as indicated above, should be sufficiently long to indicate an extended lack of interaction with the computer, suggesting that the user is not engaged in an interaction with the computer that the user would not want to have interrupted. However, the duration of time should not be so long that, for periods of user inactivity of a typical duration, the amount of time that the attention manager operates is undesirably short. In sum, choosing the duration of time that defines an idle period involves a balancing of the above considerations. Illustratively, the idle period can be defined as a period of between thirty seconds and two minutes during which the specified condition (e.g., user interaction with an input device) does not occur.

While detection of the idle period can be implemented in any suitable manner, one way in which such detection can be implemented is by monitoring an idle timer that is part of a screen saver API (application program interface) that is, in turn, part of an operating system used to operate the computer. Such screen saver APIs are commonly found in current operating systems such as the Windows or Macintosh operating systems discussed above. The idle timer could be monitored and a signal that an idle period has occurred generated when the magnitude of the idle time as indicated by the idle timer reaches a predefined threshold.

Detection of an idle period as the basis for beginning operation of the attention manager is an indirect activation of the attention manager. In an alternative embodiment, step 102 of the method 100 is modified so that the attention manager is activated directly by the user. In other words, step 102 would consist of waiting for explicit direction from the user to begin operation of the attention manager. Such explicit direction could be enabled with an appropriate user interface, such as an on-screen icon or a menu selection, that is always present on the display screen of the display device as part of a standard interface that is provided by the operating system. Examples of such standard interfaces are the "Apple Menu" provided as part of the Macintosh operating system, and the "Start Menu" or desktop icons provided as part of the Windows 95 operating system.

Returning to FIG. 1, if, in step 102, an idle period has not occurred, then the primary user interaction continues (block 101). The method 100 continues executing the step 102 at predefined time intervals (typically very short time intervals), thereby continually and frequently checking for the occurrence of an idle period.

If, in step 102, an idle period is detected, then, in the step shown in the block 103 (hereinafter referred to as step 103), a determination is made as to whether there are any sets of content data available for use in generating a display. (Hereinafter, reference is sometimes made to "displaying content data" or "displaying a set of content data"; it is to be understood that this means displaying images generated using the content data or set of content data.) Herein, "content data" refers to data that is used by the attention manager to generate displays (e.g., video images or sounds, or related sequences of video images or sounds). A "set of content data" refers to a related set of such data that is used to generate a particular display. A "clip" refers to a definable portion of a set of content data that is used to generate a particular image; a set of content data can include one or more clips and, therefore, can be used to generate one or

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more images. The acquisition of content data by the content display system is described in more detail below. Here, it is sufficient to note that, over time, an attention manager can acquire any number of sets of content data that can be displayed by the content display system.

If, in step 103, no sets of content data are available for display, then the primary user interaction continues (block 101). The method 100 continues executing the steps 102 and 103 at predefined time intervals, continually checking for the occurrence of an idle period and the acquisition of at least one set of content data.

If, in step 103, at least one set of content data is available for display, then, in the step shown in the block 104 (hereinafter referred to as step 104), the available sets of content data are scheduled for display by the content display system. (Alternatively, in other embodiments of the invention, scheduling of the sets of content data can occur before the method 100 begins. Such scheduling might be implemented, for example, so that each time a new set of content data is received by the content display system, the schedule is revised to include the new set of content data.) Typically, when the content display system acquires a new (or updated) set of content data, scheduling information for that set of content data is also acquired. Taken together, the scheduling information for all of the sets of content data is used to determine a schedule for display of the sets of content data by the content display system. Generally, determining a display schedule involves specifying the order in which the sets of content data are to be displayed and the duration of time for which each set of content data is to be displayed. The determination of the display schedule can also accommodate (to the extent possible) any special scheduling parameters for particular sets of content data (e.g., restrictions specifying when a particular set of content data must be displayed or cannot be displayed), mediating any conflicts between the display requirements of particular sets of content data. Often, though not necessarily, once the order and duration of display are established, the sets of content data are repetitively displayed by cycling through the display schedule repeatedly until operation of the attention manager is terminated. However, even where such iteration through the display schedule occurs, the display schedule can also accommodate scheduling parameters that delete sets of content data from the display schedule during particular iterations, thereby, for example, controlling the frequency with which particular sets of content data are displayed. The display schedule can be stored in an appropriately structured database, as known by those skilled in the art, that is stored in a memory of the computer used to implement the content display system.

Any appropriate set of rules, that can, for example, be arranged in any appropriate hierarchical manner, can be used for establishing a display schedule and, in particular, mediating conflicts between conflicting scheduling parameters associated with different sets of content data. For example, one rule for mediating conflicts may give preference to displaying sets of content data so that the sets of content data are displayed inversely to the order in which they were obtained by the content display system. This rule might be further specified so that a set of content data that has never previously been displayed by the attention manager is displayed prior to display of a set of content data that has been previously displayed, even though an update of the previously displayed set of content data has been obtained at a later time than that at which the never displayed set of content data was obtained. Another rule for mediating conflicts might resolve a conflict between two sets of content

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data having scheduling parameters that specify display at the same sequential position in the display schedule by randomly selecting one of the sets of content data to be displayed first during each iteration through the display schedule. Still another rule for mediating conflicts might establish a hierarchy of kinds of content data, with sets of content data of kinds at the top of the hierarchy being given preference for display over those at the bottom. Yet another rule or set of rules for mediating conflicts may involve performing some sort of analysis of the characteristics of the sets of content data that have been obtained by a particular content display system to ascertain preferences indicated thereby, and giving preference to sets of content data that are evaluated to be relatively more preferred. Scheduling rules of this kind would typically be part of the scheduling parameters provided independent of the content providers (i.e., in content display system scheduling instructions, as discussed elsewhere herein and, in particular, with respect to FIGS. 3A through 3C below).

Other scheduling rules, not directed to mediating conflicts between sets of content data, can also be used in determining a schedule. For example, any set of content data that has been initially obtained before a certain time and/or that has been last updated before a certain time (i.e., a set of content data that is "stale") can be automatically precluded from being inserted into the display schedule. This exclusion could further be restricted to apply only to certain sets of content data or content data of certain kinds. Similarly, the frequency with which a particular set of content data appears in a display schedule can be based upon how stale the set of content data is. Scheduling rules of this kind would typically be part of the scheduling parameters provided by a content provider for a set of content data (i.e., in tailored content data scheduling instructions, as discussed elsewhere herein and, in particular, with respect to FIGS. 3A through 3C below).

The particular scheduling rules used may be influenced by the characteristics of a particular embodiment of the attention manager, such as the available kinds of content data or the characteristics of the potential users of the attention manager. The particular scheduling rules used may also be influenced by the need or desire to simplify implementation of the scheduling rules.

Returning to FIG. 1, once the sets of content data have been scheduled for display, then, in the step shown in the block 105 (hereinafter referred to as step 105), a set of content data is displayed. The content display system is provided with one or more sets of display instructions to enable display of the set or sets of content data on the display device (as discussed elsewhere herein and, in particular, with respect to FIGS. 3A through 3C below).

After a set of content data has been displayed, then, in the step shown in the block 106 (hereinafter referred to as step 106), a determination is made as to whether operation of the attention manager has been terminated. Generally, operation of the attention manager can be terminated either directly or indirectly. Indirect termination of operation of the attention manager can be effected by, for example, causing operation of the attention manager to terminate when the specified condition (the non-occurrence of which is used to signal an idle period) occurs. For example, the attention manager can be terminated if the user makes an input to the computer using an input device, e.g., strikes a key on a keyboard, clicks a mouse, presses on a touch-sensitive area of a touchscreen or issues a voice command. For indirect termination, it may be desirable to add a further step or steps to the method 100 that, upon an indication that indirect termination should occur (e.g., the occurrence of the speci-

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fied condition), asks the user to confirm that termination of the attention manager is, in fact, desired, and, if so, terminates the attention manager upon appropriate specified user input. In contrast to indirect termination, direct termination of operation of the attention manager can be effected by, for example, causing operation of the attention manager to terminate when the user selects a control option that specifies such termination, as described in more detail below with respect to FIGS. 5A, 5B and 6.

If, in step 106, operation of the attention manager has been terminated, then the primary user interaction begins again (block 101). The method 100 then begins executing the step 102 again, checking for the occurrence of an idle period.

If, in step 106, operation of the attention manager has not been terminated, then, in the step shown in the block 107 (hereinafter referred to as step 107), a determination is made as to whether there is an additional set of content data to be displayed. Typically, in operation of an attention manager according to the invention, there will always be another set of content data to be displayed, since, as discussed above, the sets of content data in the display schedule are iteratively displayed until operation of the attention manager is terminated. However, this need not be the case. For example, a limit can be established on the number of times that each set of content data can be displayed, or on the total number of times that any set of content data is displayed.

If, in step 107, there are no additional sets of content data to be displayed, then the primary user interaction begins again (block 101). The method 100 then begins executing the step 102 again, checking for the occurrence of an idle period.

If, in step 107, there are additional sets of content data to be displayed, then the method 100 returns to the step 105 and displays a set of content data in accordance with the previously determined display schedule. Steps 105, 106 and 107 are continuously performed, resulting in the continuous display of sets of content data, until either the user terminates the attention manager (step 106) or there are no more sets of content data to be displayed (step 107).

In another embodiment of the invention, a step could be added to the method 100, either in place of or in addition to the step 107, or as part of the step 106, that causes operation of the attention manager to terminate after the attention manager has been operating for a specified period of time.

Further, in another embodiment of the invention, an appropriate step or steps could be added to the method 100 so that, at a specified time, such as after each iteration through the display schedule, the method 100 returns to the step 104 and re-determines the display schedule.

As described above, when the method 100 ends, the primary user interaction (block 101) begins again. Preferably, the primary user interaction begins again with the status existent at the time that the method 100 began. Thus, the primary user interaction must be held in abeyance while the method 100 is operating. This can be accomplished by implementing the method 100 (or any other embodiment of the attention manager) with a content display system that is implemented on a computer that operates with an operating system that allows "multi-tasking" (here used to mean either the suspension of one program while one or more other programs operate, or the execution of one program simultaneously with the execution of one or more other programs). The Windows and Macintosh operating systems (mentioned above), among others, are operating systems having this characteristic. Where the attention man-

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ager is implemented using a screen saver API that is part of the operating system, such multitasking occurs automatically as a characteristic of the screen saver API, i.e., when operation of the attention manager ends, the user is returned to the status of the primary interaction existent at the time that the attention manager started operating. In multitasking operating systems that do not include a screen saver API, this feature of the invention can be implemented by use of an appropriately programmed device driver, as known by those skilled in the art, that monitors user interaction, suspending and restarting the primary user interaction at the beginning and end of operation of the attention manager.

The method 100 (FIG. 1) described above is an embodiment of the invention in which the attention manager presents information to a person (which can be the user or another person) in the vicinity of the display device during inactive periods when a user is not engaged in an intensive interaction with the computer (as indicated by the step 102 which checks for the occurrence of an "idle period" before beginning operation of the attention manager). As indicated above, in other embodiments of the invention, the attention manager presents information to the person during active periods, but in an unobtrusive manner. In such embodiments, video content data could be presented, for example, as "wallpaper" on the display screen of a video display monitor. Audio content data according to these embodiments could be presented in the same way as for the embodiments of the method 100 described above. For implementation of such embodiments of the invention, the step 102 of the method 100 could be modified to be a determination as to whether the attention manager has been activated (typically this would require direct activation by the user). Alternatively, step 102 could be eliminated altogether and the attention manager could be implemented to operate at any time that the computer is operating and sets of content data are available for display (step 103). For these embodiments, it is, as above, necessary that the content display system be implemented on a computer operated by an operating system that allows multi-tasking as described above. In particular, simultaneous operation of programs must be allowed, since the attention manager operates while the primary user interaction is ongoing (note that the relationships between the block 101 and the method 100 shown in FIG. 1 are not present in these embodiments of the invention).

Though not confined to such use, the attention manager according to the invention is envisioned as having particular use as a system implemented on, and used by, a network of computers. In such an implementation, each content providing system is implemented on a content provider computer. (It is possible to have more than one content providing system on a content provider computer.) Content display systems are implemented on user computers. The content provider computers and user computers are integrated together into a network such that each user computer can communicate with one or more of the content provider computers. The content provider computers need not (and typically would not) communicate with each other. Likewise, the user computers need not (and typically would not) communicate with each other. Further, each user computer need not communicate with all, or even more than one, of the content provider computers. For example, an attention manager according to the invention could be implemented so as to make use of a network such as the Internet. In particular, the graphical attributes of the World Wide Web would be particularly useful in enabling the provision of user interfaces that allow users to access the attention manager while visiting network sites of content providing systems.

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FIG. 2 is a block diagram of a system 200 for implementing an attention manager according to an embodiment of the invention. The system 200 includes an application manager 201, a multiplicity of content providing systems, shown as Content Providers 1 through n (content providing systems 202a, 202b and 202c are illustrated in FIG. 2), and a multiplicity of content display systems, shown as Users 1 through n (content display systems 203a, 203b and 203c are illustrated in FIG. 2). Hereinafter, the content providing systems and content display systems are referred to generally using the numerals 202 and 203, respectively. In FIG. 2, the solid lines indicate that communication must occur in the system 200 and the dashed lines indicate that communication may occur. However, note that, in another embodiment of the invention, the application manager 201 is not present, and communication between any particular content display system and particular content providing system need not necessarily occur.

The application manager 201, content providing systems 202 and content display systems 203 can be implemented using appropriately programmed digital computers. Generally, the computers can be any conventional digital computers including an input device (such as a keyboard, mouse or touch screen), an output device (such as a conventional computer display monitor and/or one or more audio speakers), a processing device (such as a conventional microprocessor), a memory (such as a hard disk and/or random access memory), additional conventional devices necessary to interconnect and enable communication between the above-listed devices, and communications devices (e.g., a modem) for enabling communication with other computers of the system. For example, the application manager 201 and content providing systems 202 can be implemented using conventional server computers, while the content display systems 203 can be implemented using conventional client computers. The application manager 201, content providing system 202 and content display systems 203 could also themselves each be implemented by a client-server network of computers. Communication between the computers can be accomplished using any appropriate communication transmission lines, such as conventional telephone lines, or high speed data transmission systems such as T1, T3 or ISDN. The communication can be managed using any appropriate conventional networking methods (e.g., computer programs and protocols) and apparatus, as known by those skilled in the art. In particular, as described further below, the computers are programmed to enable the content display systems 203 to communicate with the content providing systems 202 and application manager 201 even without direct action by the user. In addition to being programmed to enable networking, each of the computers is also appropriately programmed, as described above and below, to perform the functions of the application manager 201, content providing systems 202 and content display systems 203, as appropriate.

FIGS. 3A, 3B and 3C are schematic diagrams illustrating the functional components of the application manager 201, a content providing system 202 and a content display system 203, respectively, according to an embodiment of the invention. Each of the functional components are represented by a set of instructions and/or data. (In particular, each of the sets of instructions may include, if appropriate, data related to accomplishment of the functions associated with the set of instructions; similarly, a set of content data may include, if appropriate, instructions that enable generation of an image from the set of content data.) Each of these sets of instructions and/or data can be embodied in an appropriate com-

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puter program or set of computer instructions (the latter capable of including computer instructions and data), or an appropriate set of data configured for use by a set or sets of instructions (e.g., computer program) that must interact with the set of data in order to implement the attention manager.

The application manager 201 stores a variety of instructions for use in implementing the attention manager. As shown in FIG. 3A, generally, the application manager 201 stores application instructions 310, control instructions 320, and content data acquisition instructions 330 that can be disseminated to the content display systems 203 and content providing systems 202 as necessary or appropriate. The application manager 201 can also store audit instructions 340 that can be used to enable monitoring of usage of the attention manager.

The application instructions 310 include operating instructions 311 for beginning, managing and terminating operation of the attention manager on a content display system 203, and content display system scheduling instructions 312 for scheduling the display of content data on a content display system 203. The method 100 (FIG. 1) described above is one embodiment of such application instructions 310. The application instructions 310 also include installation instructions 313 that enable the other instructions used by the attention manager to be implemented using the hardware that is part of and associated with a particular content display system 203. The installation instructions 313 can be implemented as known by those skilled in the art. For example, the installation instructions 313 can be a "plug-in" or "helper" application program (such as a helper application that can be used with the Navigator and Mosaic software programs made by Netscape Communications Corp. of Mountain View, Calif.) that is used to process instructions or data of a particular type—in this case, instructions to implement the attention manager, and content data for use with the attention manager, that can be installed on the hardware of a particular content display system 203. There can be a multiplicity of such helper applications, each capable of operating on particular hardware that could be used to implement a content display system 203. The helper application enables the software program (i.e., Navigator or Mosaic) being used to access the sites of content providers to process references (e.g., Universal Resource Locators, or "URLs") to the particular type of instructions and/or data, so that sets of content data (including updated sets of content data) and the application instructions 310, control instructions 320 and content data acquisition instructions 330 (including updated versions of those instructions) can be acquired.

The control instructions 320 include display instructions 321 and content data scheduling instructions 322, as described in more detail below, that are typically enhanced by content providers in a particular manner that is appropriate for the content data that the content providers provide. The application manager 201 can (and typically does) store and disseminate multiple distinct sets of control instructions 320. Generally, the display instructions 321 of a particular set of control instructions 320 enable display of content data on a particular type of display device (e.g., a particular type of computer video display or a particular type of audio speaker) or display of a particular type of content data. Display instructions 321 that can be used with a particular display device are typically already developed by third parties (e.g., the maker of the display device) and are readily available. Tailoring of the display instructions 321 to display particular types of content data (such as instructions for displaying content data that is in the GIF format or the

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format of AutoDesk Animator FLC files) can be done by either the application manager 201 or a content provider. The content data scheduling instructions 322 provide temporal constraints on the display of particular sets of content data. As stored by the application manager 201, the content data scheduling instructions 322 are usually the same for each set of control instructions 320 and provide a generic set of scheduling instructions that can be tailored by a content provider.

The content data acquisition instructions 330 include acquisition instructions 331 for enabling the initial acquisition of a set of content data and instructions for implementing the attention manager, and content data update instructions 332 for enabling update of previously obtained sets of content data and attention manager instructions. The acquisition instructions 331 and content data update instructions 332 are generic sets of instructions that can be tailored by a content provider. The content data acquisition instructions 330 can also include user interface installation instructions 333 that enable content providers to install a user interface in the information environment (e.g., Web page) of the content provider so that users can request sets of content data from the content provider. Such user interface installation instructions are conventional and readily available for use with the attention manager of the invention.

As shown in FIG. 3B, the content providing systems 202 store one or more sets of content data 350 that can be disseminated to content display systems 203 as requested. The content providing systems 202 can also store the application instructions 310, control instructions 320, and content data acquisition instructions 330 described above.

As indicated above, each set of content data 350 defines a related group of data that is used to generate a particular display and includes one or more clips that each represent a definable portion of the set of content data that is used to generate a particular image. The content data 350 represents sensory data and can be, for example, video or audio data. A particular set of content data 350 can be formulated in different versions that are each compatible with content display systems 203 having particular characteristics. In particular, the characteristics of the display device of a content display system 203 can affect the formulation of a set of content data 350. For example, for computer video display monitors, the formulation of a version of a set of content data 350 can depend on the size of the display screen (e.g., horizontal length by vertical length), the display resolution (e.g., the number of horizontal pixels by the number of vertical pixels), the color depth (number, e.g., 256, of possible colors) and the characteristics of the display drivers for the display device. The formulation of a version of a set of content data 350 could also depend upon the operating system being used by the computer on which the content display system 203 is implemented or other characteristics of the computer, such as the speed with which the display device can be operated (insofar as that speed is affected by the characteristics of the computer such as processor speed). Generally, a set of content data 350 can be formatted as known by those skilled in the art in view of the above considerations.

As indicated above, the control instructions 320 (as well as the content data acquisition instructions 330) are typically enhanced by content providers as appropriate for particular content data. The manner in which these instructions can be tailored by content providers is desirably required to conform to a specified format. Below, a description is given of package files that can be used for tailoring the control instructions 320 and content data acquisition instructions

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330, as well identifying the location of content data. These package files can be created using an appropriate computer program (package file editor) that can be provided by, for example, the application manager 201 and that enables this tailoring to be accomplished easily and according to the specified format.

The content provider can tailor the content data scheduling instructions 322 to indicate the duration of time that a particular set of content data can be displayed ("duration instructions"). Generally, the duration instructions can be arbitrarily complex and can vary in accordance with a variety of factors, including, for example, the particular time at which the set of content data 350 is displayed after the attention manager begins operating, or the number of previous times that the set of content data 350 has been displayed during a continuous operation of the attention manager. The content provider can also tailor the content data scheduling instructions 322 to indicate an order in which the clips of a set of content data 350 are displayed, as well as the duration of the display for each clip ("sequencing instructions"). The content provider can also tailor the content data scheduling instructions 322 to indicate particular times or ranges of times at which a set of content data 350 can or cannot be displayed ("timing instructions"). These times can be absolute (e.g., a particular clock time on a particular day, a particular day or days during a week, after or before a specified date) or relative (e.g., not before or after a specified duration of time since the attention manager began operation, first or not first among the sets of content data 350 to be displayed, not after a particular kind or set of content data 350). The content provider can also tailor the content data scheduling instructions 322 to specify a maximum number of times that the set of content data 350 can be displayed after the attention manager begins operating or a maximum number of times that the set of content data 350 can be displayed over any number of operations of the attention manager ("saturation instructions").

The content provider can also tailor the display instructions 321 to display a particular set or sets of content data. The display instructions 321 can be tailored, for example, according to the type or types of the content data. The type of content data indicates the manner in which an image or images are generated from the content data (i.e., how the bit patterns in a particular clip are transformed into an image). The type of content data is typically established as a consequence of the manner (e.g., with a particular software application program such as the Photoshop or Premiere programs produced by Adobe Systems of Mountain View, Calif.) in which a particular clip is created. The installation instructions 313, discussed above, enable content data of different types to be obtained by the attention manager. Generally, the possible types of content data can be confined to an enumerated set of standard data types, such as the Mime data types used with the World Wide Web. As will be more readily understood from the description below, the type of content data can be specified, for example, in a field of the clip part of a package file.

The ability to tailor sets of content data 350 and associated control instructions 320 for particular content display systems 203, before the sets of content data 350 and control instructions 320 are provided to those content display systems 203, is advantageous because it allows the tailoring to be done once, by the content providing system 202 or the application manager 201, rather than multiple times, once by each content display system 203 that uses the set of content data 350 and associated control instructions 320.

The content data acquisition instructions 330—in particular, the content data update instructions 332—are also

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tailored by content providers as appropriate for particular sets of content data 350. In particular, the content provider can tailor the content data acquisition instructions 330 to indicate where and when to obtain an updated set of content data 350. For example, the indication of where to obtain an updated set of content data 350 can be accomplished by specifying an appropriate network address of a content providing system 202. The network addresses can be specified by, for example, a URL used to identify, for example, an HTML file, an applet (a short application program written in Java or other suitable programming language), a script based on CGI or other suitable mechanism, or any other resource (i.e., computer program or set of data). The indication of when to obtain an updated set of content data 350 can be accomplished by specifying a time or times, either absolute time or times (i.e., particular dates and times during the day) or relative time or times (e.g., one month after the last acquisition/update of the set of content data 350). For example, the update schedule could be established to obtain updates every hour, every day or every week. Or, the update schedule could be established to obtain updates upon the occurrence of a particular event, such as a specified percentage increase or decrease in a stock market index. In general, the particular update schedule used will depend upon the character of the content data with which the update schedule is associated, e.g., content data representing stock prices would probably be updated more frequently than content data representing an advertisement.

As shown in FIG. 3C, the content display systems 203 store the application instructions 310, control instructions 320, and content data acquisition instructions 330 described above. The application instructions 310 use the control instructions 320 to display sets of content data 350 that are obtained (and updated, if appropriate) by the content data acquisition instructions 330. The application instructions 310 and control instructions 320 are discussed generally, and with respect to particular embodiments, in more detail above, while an embodiment of the content data acquisition instructions 330 is described below.

FIG. 4 is a flow chart of a method 400 according to the invention for acquiring and updating sets of content data, i.e., the method 400 is an embodiment, at least in part, of the acquisition instructions 331 and content data update instructions 332 of the content data acquisition instructions 330 discussed above with respect to FIGS. 3A through 3C. In the method 400, the steps shown by blocks 402 through 407 can be implemented in the acquisition instructions 331 and the steps shown by blocks 403 through 410 can be implemented in the content data update instructions 332. Generally, the steps of the method 400 can be implemented on an appropriately programmed digital computer that is programmed to perform the functions of the method 400, as described below. Below, the method 400 is described as implemented on such a digital computer, though the method 400 is not limited to such an implementation. The method 400 necessitates communication between a content display system 203 and one or more content providing systems 202. As will be understood by those skilled in the art of digital computer programming for computer network communications, when the method 400 is implemented using a programmed digital computer, particular steps of the method 400 could be implemented on either a content display system 203 or a content providing system 202.

In the step shown in the block 401 (referred to hereinafter as step 401), a set of content data is selected for display by the attention manager. Initially, in step 401, particular sets of content data are obtained as a result of direct request by the

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user. Any appropriate user interface can be used for enabling a user to directly request a particular set of content data. For example, Web pages on the World Wide Web could include graphical buttons for enabling users that visit the Web page to request particular sets of content data. Selection of a button on a Web page results in an indication to the appropriate content providing system 202 that the requesting content display system 203 has requested the set of content data corresponding to the selected button to be transferred to the content display system 203. The user interface instructions 333 discussed above, that can be provided to each content providing system 202, can be used to create the user interface.

Selection of a set of content data in step 401 causes a set of acquisition instructions 331 to be transferred to the content display system 203. The acquisition instructions 331 include information identifying the site from which the set of content data can be obtained, as well as the site or sites from which instructions (e.g., application instructions 310, control instructions 320, content data acquisition instructions 330 and audit instructions 340) for implementing the attention manager can be obtained. These sites can be the same or different sites. The sites can be identified by, for example, using URLs, as described above. The acquisition instructions 331 can also include instructions for establishing an appropriate user interface (e.g., a desktop icon) in the content display system 203 that enables a user to cause the installation instructions 313 to be executed, thereby installing the attention manager in the content display system 203.

In the step shown in the block 402 (referred to hereinafter as step 402), a determination is made as to whether the requesting content display system 203 has the application instructions 310 (FIGS. 3A through 3C) that enable operation of the attention manager and scheduling of sets of content data 350. If the content display system 203 does not have the application instructions 310, then, in the step shown in the block 405 (referred to hereinafter as step 405), the content display system 203 uses the appropriate site identification provided by the content providing system 202 to obtain a version of the application instructions 310 (typically the most current version of the application instructions 310 that is compatible with the set of content data 350 requested by the user). The application instructions 310 can be provided by the content providing system 202 from which the set of content data 350 is being obtained. Alternatively, the application instructions 310 can be provided directly to the content display system 203 by the application manager 201 (or from some site other than a content provider or the application manager 201) by causing an appropriate instruction to be issued to the application manager 201 (or other site) by either the content providing system 202 or the content display system 203.

If the content display system 203 does have the application instructions 310 (step 402), then, in the step shown in the block 403 (referred to hereinafter as step 403), a determination is made as to which version or versions of the application instructions 310 the content display system 203 has. As indicated elsewhere, a particular set of content data 350 can (and typically will) be updated from time to time, thereby creating different versions of the set of content data 350. Likewise, the application instructions 310 can also be updated, thereby creating different versions of the application instructions 310. In general, a set of content data 350 can be updated without regard to whether the set of content data is compatible with all versions of the application instructions 310 (though the set of content data 350 must be compatible with at least one version of the application

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instructions 310). Likewise, the application instructions 310 can be updated without regard to whether any particular set of content data 350 is compatible with that version of the application instructions 310. Moreover, particular versions of the application instructions 310 may be compatible only with sets of content data 350 of certain types. Consequently, a particular content display system 203, even though the content display system 203 has the application instructions 310, may not have a version of the application instructions 310 that is compatible with the type and/or version of the set of content data 350 being requested.

It is necessary, therefore, to determine whether the content display system 203 has a version of the application instructions 310 that is compatible with the type and version of the set of content data 350 being requested so that, if necessary, a compatible set of application instructions 310 can be provided to the content display system 203. In the step shown in the block 404 (referred to hereinafter as step 404), this determination is made. If the content display system 203 does not have a compatible version of the application instructions 310, then, in step 405, the content providing system 202 (or, for example, the application manager 201) provides to the content display system 203 a version of the application instructions 310 (typically the most current version) that is compatible with the requested set of content data 350.

Alternatively, in step 404, a determination could be made as to whether the version of the application instructions 310 that the content display system 203 has is the most current version of a set of compatible application instructions 310. If the version is not the current version, then the content providing system 202 provides the current version (step 405), even if the version that the content display system 202 already had is compatible with the newly acquired set of content data 350.

Preferably, updated sets of application instructions 310 are made downwardly compatible with previous sets of application instructions 310, so that the updated application instructions 310 can be used with any previously obtained sets of content data that are compatible with a previous set of application instructions 310. If downward compatibility is not maintained, the updated set of application instructions 310 can replace a previous set of application instructions 310 and incompatible sets of content data can be removed from the schedule of sets of content data to be displayed (this can be accomplished by the use of appropriate instructions in the content display system scheduling instructions 312 that check for the compatibility of sets of content data with the existing set of application instructions 310) when the attention manager is operating. The content data update instructions 332 can also include instructions that ascertain the current version of the application instructions 310 and, for each set of content data 350 that is incompatible with the current version of the application instructions 310, seek to obtain, at the time scheduled for an update, an updated set of content data 350 that is compatible with the current version of the application instructions 310.

The steps 402 through 405 are advantageous in that they result in the provision of application instructions 310 to a content display system 203 only when such instructions are needed, thus minimizing the number of sets of application instructions that are made available. The steps 402 through 405 also minimize the amount of information that must be transmitted over communication lines to the content display system 203, thereby freeing those lines for other communication and minimizing the cost (i.e., cost of using the communication lines) associated with using the attention manager of the invention.

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Returning to FIG. 4, in the step shown in the block 406 (referred to hereinafter as step 406), the content providing system 202 provides the current set of content data 350 to the content display system 203. (In practice, the set of content data 350 can be provided before, after or simultaneously with provision of the application instructions 310.) Further, as described above, a particular set of content data 350 can exist in different versions that are each compatible with the content display system 203 to which the version of the set of content data 350 is being provided. The step 406 can include a determination as to the version or versions of the set of content data 350 that can be used by the requesting content display system 203, so that a properly formulated set of content data 350 is acquired.

A set of control instructions 320 and content data acquisition instructions 330 (FIGS. 3A through 3C) associated with the set of content data 350 can also be provided, as shown by the step of block 407 (referred to hereinafter as step 407). Typically, a check is made (like that for the application instructions 310 and providing similar benefits) to determine whether the content display system 203 already has a compatible (and/or current) version of the control instructions 320 and/or the content data acquisition instructions 330 associated with the set of content data 350 being obtained.

Each set of content obtained by a content display system 203 can be stored in a database (having any suitable structure) that is stored in a memory of the computer used to implement the content display system 203. The database can also store other information associated with each set of content data 350. This information is discussed in more detail below in the discussion of package files which can be used to convey such information from the content providing systems 202 to the content display systems 203. The package file editor mentioned above can be provided to each content providing system 202 to enable the content provider to easily create a package file for each set of content data 350 provided by that content provider.

Each package file includes a reference to the set of content data 350 (e.g., a network address) to which that package file corresponds. As mentioned above, each package file can also include a variety of other information. For example, the package file can include a specification of the format of the content data 350 (i.e., an indication of the types of content display systems 203 with which the set of content data 350 is compatible) and the type of the content data (e.g., an identification of a particular graphical format, as discussed above). (This information might be specified explicitly or implicitly; alternatively, this information may be passed to the content display system 203 separately from the package file.) The package file can additionally include a text description of the contents of the package file (this could be used, for example, in a user interface that lists descriptions of all of the sets of content data available to a content display system 203 or provided by a content providing system 202). The package file can also include information governing the presentation of the set of content data, such as screen position, special animation effects and display duration (the latter is shown by the View-Time attribute in the Example below). The update information (location and schedule) is also included in the package file. The package file can also include linking information (e.g., network address of an information source) used to implement a link option discussed in more detail below. The content data scheduling information discussed above can also be included in the package file. The package file can also include data structures that can be used to store auditing information, as

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discussed in more detail below. The package file can also include reference to one or more sets of control instructions 320, each set of control instructions 320 enabling display of the set of content data 350 by a content display system 203 having a particular architecture, or enabling display of clips of particular types.

The following Example illustrates how a package file for use with the invention could be constructed. The package file of this Example does not include all types of information that could be included in a package file; it is to be understood that other types of information (as discussed above, for example) could be included in such a package file, expressed in a similar manner to that shown in the Example. In this illustration, the package file is constructed in an object-oriented manner. Generally, each statement in the package file conforms to the following syntax:

keyword{attribute:value(1) . . . attribute:value(n)}

where "keyword" can be either PACKAGE or CLIP, "attribute" identifies one of the types of information discussed immediately above, and "value" is an identification of particular content for the type of information. There can be any number of "attribute:value" pairs in a statement. In the Example, each attribute:value pair is designated at right by a numeral enclosed in parentheses to aid in the description; this numeral does not form part of the package file shown in the Example.

#### EXAMPLE

```

PACKAGE {
  Object-Id: 1 (1)
  Object-Type: 1 (2)
  Source: http://www.interval.com/~freiberg/ (3)
         Netscreen/Bookreviews/reviews.nss
  Name: Book Reviews: Day 1 (4)
  Description: (5)
  Update-Frequency: 720 (6)
}
CLIP {
  Object-Id: 16919316 (7)
  Object-Type: 2 (8)
  Source: http://www.interval.com/~freiberg/ (9)
         Netscreen/Bookreviews/1%20Day%20Book/
         bookreview-1-a1.gif
  Name: Anger (10)
  Description: Book Review (11)
  Update-Frequency: 0 (12)
  View-Time: 15 (13)
  Followup-URL: http://www.randomhouse.com/ (14)
                knopf/
  Linked-To-Following: 1 (15)
}
CLIP {
  Object-Id: 16919384 (16)
  Object-Type: 2 (17)
  Source: http://www.interval.com/~freiberg/ (18)
         Netscreen/Bookreviews/1%20Day%20Book/
         bookreview-1-a2.gif
  Name: Emotional Intelligence (19)
  Description: (20)
  Update-Frequency: 0 (21)
  View-Time: 15 (22)
  Followup-URL: http://www.randomhouse.com/ (23)
                knopf/
  Linked-To-Following: 0 (24)
}

```

The first part of line 1 indicates that the following describes a package file. The remainder of line 1 and line 2 are used in debugging and are not relevant to the invention. Line 3 specifies a network address that identifies the location of the package file. (Note that the type of the package file is suggested in line 3 by the file extension .nss, though this

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In the step shown in the block 408 (referred to hereinafter as step 408), a determination is made as to whether it is time to update the set of content data 350. The update schedule discussed above is used for this purpose. As long as the

In the step shown in the block 410 (referred to hereinafter as step 410), a determination is made as to whether an updated set of content data 350 is available on the content providing system 202. If an updated set of content data 350 is not available, then the step 408 begins executing again, continuing until the update schedule indicates that it is again time to check for an updated set of content data 350. If an updated set of content data 350 is available, then the method 400 returns to the step 403, and an updated set of content data 350 and, if necessary, related control instructions 320 and content data acquisition instructions 330 are provided to the content display system 203 (i.e., an appropriate package file is provided to the content display system 203). As discussed above, the content display system 203 compares the version of the package file contents stored in the database to the contents of the version of the package file being newly provided, and makes changes to the database as necessary.

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FIGS. 5, 5A, 5B and 5C together are a flow chart of a method 500 that implements an attention manager according to another embodiment of the invention. FIG. 5 illustrates the relationship between FIGS. 5A–5C. Like the method 100 (FIG. 1), the method 500 is performed by a content display system 203 according to the invention which can be implemented, for example, using a digital computer that includes a display device and that is programmed to perform the functions of the method 500, as described below. Below, the method 500 is described as implemented on such a digital computer, though the method 500 could be implemented on other apparatus. Steps in the method 500 that are the same as steps in the method 100 are shown by like-numbered blocks. Generally, the method 500 differs from the method 100 in that the method 500 provides a number of control options that enable the user to effect particular types of control of the attention manager. While the method 500 and the associated description below illustrate several control options that can be used with an attention manager according to the invention, it is to be understood that an attention manager according to the invention could include any of a number of other options not shown in FIGS. 5, 5A, 5B, and 5C, or described specifically herein.

The attention manager according to this embodiment of the invention can include any suitable user interface to enable the user to specify a control option. FIG. 6 illustrates a computer display screen 600 including one embodiment of such a user interface. The screen 600 displays, in addition to an image generated from a set of content data 350, a dialog box 601 that includes a list of available control options 602a through 602e. The dialog box 601 can remain on the screen 600 during the entire time that the attention manager is operating. The available control options 602a through 602e shown in the dialog box 601—as well as additional control options that could be, but are not, included in the dialog box 601—are discussed in more detail below.

The manner of selecting an option depends upon the available user input device(s). For example, a keyboard could be used to move a cursor to a desired option, which is then selected using the Enter key. Or, a mouse could be used to move a cursor to a desired option, then clicked to select the option. Or, a touch pen could be used to contact the screen 600 (if the screen 600 is a touch-sensitive screen) at an appropriate location to cause a desired option to be selected. Or, an audio command could be issued to a voice recognition system which causes the desired option to be selected.

One control option that can be used with an attention manager according to the invention enables the user to directly terminate operation of the attention manager. In FIG. 6, this is shown as the “exit” option 602a. In the method 500, this option is implemented using the step 107. As discussed above, selection of the “exit” option 602a causes the primary user interaction to begin again (block 101).

Another control option that can be used with an attention manager according to the invention enables the user to terminate display of the currently displayed set of content data and begin display of the next scheduled set of content data. In FIG. 6, this is shown as the “next” option 602b. In the method 500, this option is implemented by the step shown in the block 501.

Yet another control option that can be used with an attention manager according to the invention enables the user to terminate display of the currently displayed set of content data and begin display of the set of content data

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displayed immediately prior to the terminated set. In FIG. 6, this is shown as the “back” option 602c. In the method 500, this option is implemented by the steps shown in the blocks 502 and 511.

Still another control option that can be used with an attention manager according to the invention enables the user to terminate display of the currently displayed set of content data and remove that set of content data from the schedule so that the set will not be displayed in the future. This option is not shown in FIG. 6. In the method 500, this option is implemented by the steps shown in the blocks 503 and 512. In a particular embodiment, this option can be implemented so that the set of content data is precluded from being displayed only during the current operation of the attention manager. In another particular embodiment, this option can be implemented so that the set of content data is removed from the content display system 203 entirely, i.e., the set of content data is no longer available for display. In this embodiment, the set of content data could only become available for display again if the user takes affirmative steps to re-obtain the set of content data, as described above with respect to step 401 of the method 400 (FIG. 4).

Another control option that can be used with an attention manager according to the invention enables the user to prevent future display of the currently displayed set of content data until that set of content data has been updated. This option is not shown in FIG. 6. In the method 500, this option is implemented by the steps shown in the blocks 504, 513, 521, 522 and 523 (referred to hereinafter as steps 504, 513, 521, 522 and 523, respectively). If this option is selected in step 504, then an update flag is activated. The update flag can be a designated field associated with a particular set of content data in the database that contains all of the available sets of content data. As shown by step 521, the method 500 identifies, before display of a next set of content data in the schedule, the identity of that next set, and determines (step 522) whether the update flag has been activated for that set of content data. If the update flag has not been activated, then, in step 105, the set of content data is displayed. However, if the update flag has been activated, then, in step 523, a determination is made as to whether the set of content data has been updated since the last time that the set of content data was displayed. This step can be accomplished by checking an update monitor flag that can be a designated field of the database that is associated with the set of content data. If the update monitor flag indicates that the set of content data has been updated since the last time that the set of content data was displayed, then the set of content data is displayed (step 105). Otherwise, the method 500 returns to the step 521 to identify the next set of content data in the schedule.

Yet another control option that can be used with an attention manager according to the invention enables the user to specify a level of satisfaction with the currently displayed content data. This option is not shown in FIG. 6. In the method 500, this option is implemented by the steps shown in the blocks 505, 514 and 515. Depending upon the level of satisfaction indicated in the step 514, the schedule can be modified (step 515) to show the set of content data more, less or at different times than was previously the case. This option can be implemented in any appropriate manner; one way is described immediately below.

The content display system scheduling instructions 312 can include instructions that evaluate a probability function each time that a set of content data in the schedule is presented for display, and either display or not display the set of content data dependent upon the evaluation of the

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probability function. The probability function can include consideration of a variety of factors (e.g., the amount of time that has passed since a particular set of content data has been updated), but for implementation of the instant option, the probability function includes a term  $np$ , where  $n$  is a constant between 1 and 2, and  $p$  is a variable that represents a user's preference for a particular set of content data. Initially, the value of  $p$  is 0. Each time that a user indicates a like or dislike for a set of content data (by, for example, selecting an appropriate option in a dialog box such as the dialog box 601), the variable  $p$  is incremented or decremented, respectively, by a predetermined amount. The content display system scheduling instructions 312 evaluate a stochastic probability function (e.g., a Gaussian probability function) using the evaluated probability function as an argument. If the result of evaluation of the stochastic probability function is "true", then the set of content data is displayed; if "false", then the set of content data is not displayed. As can be seen, then, initially (i.e., when  $p=0$ ), the user has expressed no like or dislike of a set of content data and the set of content data is displayed or not according to other criteria. Incrementing or decrementing  $p$  (i.e., expressing like or dislike for a set of content data) causes the term  $np$  to increase or decrease exponentially, thereby increasing or decreasing the likelihood that the set of content data will be displayed.

Still another control option that can be used with an attention manager according to the invention enables the user to establish a link with another information source. In FIG. 6, this is shown as the "more" option 602d. (In "wallpaper" embodiments of the invention, this option can be implemented so that any time the user clicks a mouse—or presses the "Enter" key on a keyboard—when the cursor is within the wallpaper, the link is made to the other information source.) In the method 500, this option is implemented by the steps shown in the blocks 506, 516 and 517. Links can be established to any of a variety of information sources and types of information sources. Typically, the link will be made to an information source that provides information that is related to the content data which was being displayed when the link was established. Upon selection by the user of this control option, the information source is accessed and additional information retrieved for presentation to the user. A link can be made, for example, to any information source that is part of a network which can be accessed by the computer with which the attention manager is being used (though it is not necessary that the link be made through a network). For example, the attention manager can be implemented so that links can be established to locations on the World Wide Web using the appropriate URLs. Such links can be established using any of a variety of Web browser software programs, such as the Navigator software program made by Netscape Communications Corp. Links are enabled by appropriately specifying the location (e.g., a network address) of the information source. The location of an information source (or locations of information sources) can be specified by associating the location with the set of content data, for example, in a package file as described and illustrated above.

As shown in the method 500, the attention manager continues to operate during the time that the link is established and the link is established to an information source from which it is possible to return to the attention manager (see step 517). The presentation of the new information to the user can include an appropriate user interface mechanism that allows the user to request such a return to the attention manager. However, the capacity to return to opera-

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tion of the attention manager may not always exist. In that event, the step 517 is not part of the method 500; rather, the method 500 terminates after the step 516 and the user operates in the environment of the information source from that point forward. Such termination of the attention manager will frequently be the case where the link is made via a network to an information source.

Another control option that can be used with an attention manager according to the invention enables the user to obtain an overview of all of the content data available for display by the attention manager. This option is not shown in FIG. 6, nor is it implemented in the method 500 of FIGS. 5A and 5B. The overview could be presented textually, pictorially or aurally. The overview information can be obtained either via a link to another information location (e.g., the location of the application manager 201) as described above or from a memory associated with the content display system 203, the overview information having been communicated to the content display system 203 when a set of content data was obtained.

Still another control option that can be used with an attention manager according to the invention enables the user to maintain display of the currently displayed set of content data 350 until such display is terminated by the user. This option is not shown in FIG. 6, nor is it implemented in the method 500 of FIGS. 5A and 5B. Upon selection of this option, an appropriate user interface could be made to appear that allows the user to specify termination of the display. After termination of the display, the attention manager resumes normal operation, i.e., the next set of content data 350 is displayed.

The dialog box 601 also includes an additional option, the "cancel" option 602e. Selection of the "cancel" option 602e causes the dialog box 601 to be removed from the screen 600. The dialog box 601 can be made to reappear again using any appropriate technique. For example, the application instructions 310 can include appropriate instructions to cause the dialog box 601 to reappear when the user makes an input to the computer using an input device.

As discussed above (see FIG. 2), usage of the attention manager can be audited using audit instructions 340 (FIGS. 3A and 3C) that can be supplied by the application manager 201 to the content display systems 203, either directly or via the content providing systems 202. The audit instructions 340 can include instructions that cause a content display system 203 to record, as the attention manager is used, particular information (audit information) regarding use of the attention manager (or compute such information from other, more basic information recorded by the attention manager). The audit information can be stored by the content display system 203 in an appropriately structured database. The audit information can include, for example, the identity of each set of content data 350 displayed by the attention manager, the number of times that a set of content data 350 was displayed by the attention manager, the frequency (e.g., number of times per week) that a set of content data 350 was displayed by the attention manager, the times at which a set of content data 350 was displayed by the attention manager, a user-expressed satisfaction level for a particular set of content data 350, and the last set of content data 350 displayed to a user before the user either "passively" (i.e., by making an input to the computer with an input device) or "actively" (i.e., by selecting a control option) terminated operation of the attention manager (of interest, since the user presumably was viewing the display screen when such interaction occurred). The audit instructions can also include instructions that compile and/or

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analyze the audit information in a desired manner. The audit instructions 340 can also include instructions that cause audit information to be transmitted to a remote site (e.g., the application manager 201 or a content providing system 202). These instructions can include scheduling instructions that govern when the audit information is so communicated (e.g., after periodic time intervals), as well as instructions that identify the location (e.g., network address) of the remote site. The transfer of audit information can be accomplished, for example, using a conventional electronic mail mechanism, as known to those skilled in the art. The audit instructions 340 can also include instructions that enable the content display system 203 to display audit information. Additionally, the audit instructions 340 can include instructions that enable the user to disable the audit function entirely, or that enable the user to prevent audit information from being transmitted to the application manager 201 and/or to content providing systems 202. These last instructions could also be accompanied by operating instructions that provide a control option or options to the user, in a manner similar to that described above with respect to FIGS. 5A, 5B and 6, that enable the user to select disablement of the audit function. The audit instructions 340 can also include instructions that cause the database of audit information to be erased at an appropriate time, such as after the audit information has been communicated to a remote site.

Auditing of use of the attention manager can be useful to both users of the attention manager and content providers for a variety of reasons. Such auditing can be used, for example, to illustrate to content providers the value of the attention manager as a tool for disseminating the content provider's information, by showing the content providers how many content data display systems 203 are displaying the content provider's content data. The auditing can also give content providers insight into the interests of computer users, enabling the content providers to better target the information that the content providers provide. The auditing can also indicate to a user the amount and types of the information that the user has been receiving.

Various embodiments of the invention have been described. The descriptions are intended to be illustrative, not limitative. Thus, it will be apparent to one skilled in the art that certain modifications may be made to the invention as described without departing from the scope of the claims set out below. For example, though it is contemplated that an attention manager according to the invention will typically be used to occupy the peripheral attention of a human computer user, generally the attention manager can be used to occupy the attention of any sentient being. For example, the attention manager may be useful in occupying the attention of domesticated animals such as dogs or cats, or providing training (i.e., audio that can be repeated) for a "talking" bird such as a parrot.

We claim:

1. A method for engaging the peripheral attention of a person in the vicinity of a display device, comprising the steps of:

providing one or more sets of content data to a content display system associated with the display device and located entirely in the same physical location as the display device;

providing to the content display system a set of instructions for enabling the content display system to selectively display, in an unobtrusive manner that does not distract a user of the display device or an apparatus associated with the display device from a primary interaction with the display device or apparatus, an image or images generated from a set of content data; and

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auditing the display of sets of content data by the content display system;

wherein the one or more sets of content data are selected from a plurality of sets of content data, each set being provided by an associated content provider, wherein each associated content provider is located in a different physical location than at least one other content provider and each content provider provides its content data to the content display system independently of each other content provider and without the content data being aggregated at a common physical location remote from the content display system prior to being provided to the content display system, and wherein for each set the respective content provider may provide scheduling instructions tailored to the set of content data to control at least one of the duration, sequencing, and timing of the display of said image or images generated from the set of content data.

2. A method as in claim 1, wherein the display device comprises a television.

3. A computer readable medium encoded with one or more computer programs for enabling engagement of the peripheral attention of a person in the vicinity of a display device, comprising:

instructions for providing one or more sets of content data to a content display system associated with the display device and located entirely in the same physical location as the display device;

instructions for providing to the content display system a set of instructions for enabling the content display system to selectively display, in an unobtrusive manner that does not distract a user of the display device or an apparatus associated with the display device from a primary interaction with the display device or apparatus, an image or images generated from a set of content data; and

instructions for auditing the display of sets of content data by the content display system;

wherein the one or more sets of content data are selected from a plurality of sets of content data, each set being provided by an associated content provider, wherein each associated content provider is located in a different physical location than at least one other content provider and each content provider provides its content data to the content display system independently of each other content provider and without the content data being aggregated at a common physical location remote from the content display system prior to being provided to the content display system, and wherein for each set the respective content provider may provide scheduling instructions tailored to the set of content data to control at least one of the duration, sequencing, and timing of the display of said image or images generated from the set of content data.

4. A computer readable medium as in claim 3, wherein the one or more computer programs enable display of an image or images on a display device comprising a television.

5. A computer readable medium encoded with one or more computer programs for enabling engagement of the peripheral attention of a person in the vicinity of a display device, comprising:

instructions for acquiring a set of content data from a content providing system;

instructions for detecting an idle period of predetermined duration; and

instructions for selectively displaying on the display device, after detection of the idle period and in an

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unobtrusive manner that does not distract a user of the display device or an apparatus associated with the display device from a primary interaction with the display device or apparatus, an image or images generated from the set of content data;

wherein the set of content data is selected from a plurality of sets of content data, each set being provided by an associated content provider, wherein each associated content provider is located in a different physical location than at least one other content provider and each content provider provides its content data to a content display system associated with the and located entirely in the same physical location as the display device independently of each other content provider and without the content data being aggregated at a common physical location remote from the content display system prior to being provided to the content display system, and wherein for each set the respective content provider may provide scheduling instructions tailored to the set of content data to control at least one of the duration, sequencing, and timing of the display of said image or images generated from the set of content data.

6. A computer readable medium as in claim 5, wherein the one or more computer programs enable display of an image or images on a display device comprising a television

7. A content display system for engaging the peripheral attention of a person in the vicinity of a display device located in the same physical location as the content display system, comprising:

data acquisition apparatus that enables acquisition of a set of content data;

display apparatus that effects selective display on the display device, in an unobtrusive manner that does not distract a user of the display device or an apparatus associated with the display device from a primary interaction with the display device or apparatus, of an image or images generated from the set of content data;

user input apparatus that enables selection by a user of one or more control options during the selective display of the image or images generated from the set of content data; and

a system control device that controls aspects of the operation of the system in accordance with a selected control option;

wherein the set of content data is selected from a plurality of sets of content data, each set being provided by an associated content provider, wherein each associated content provider is located in a different physical location than at least one other content provider and each content provider provides its content data to the content display system independently of each other content provider and without the content data being aggregated at a common physical location remote from the content display system prior to being provided to the content display system, and wherein for each set the respective content provider may provide scheduling instructions tailored to the set of content data to control at least one of the duration, sequencing, and timing of the display of said image or images generated from the set of content data.

8. A system as in claim 7, wherein the display device comprises a television.

9. A system as in claim 7, wherein:

a link control option enables the user to establish a link with an information location; and

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the system control device establishes the link with the information location in response to selection of the link control option.

10. A method for engaging the peripheral attention of a person in the vicinity of a display device, comprising the steps of:

acquiring a set of content data from a content providing system;

selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the display device or an apparatus associated with the display device from a primary interaction with the display device or apparatus, an image or images generated from the set of content data;

enabling selection by a user of one or more control options during the selective display of the image or images generated from the set of content data; and

controlling aspects of the operation of the system in accordance with a selected control option;

wherein the set of content data is selected from a plurality of sets of content data, each set being provided by an associated content provider, wherein each associated content provider is located in a different physical location than at least one other content provider and each content provider provides its content data to a content display system associated with the and located entirely in the same physical location as the display device independently of each other content provider and without the content data being aggregated at a common physical location remote from the content display system prior to being provided to the content display system, and wherein for each set the respective content provider may provide scheduling instructions tailored to the set of content data to control at least one of the duration, sequencing, and timing of the display of said image or images generated from the set of content data.

11. A method as in claim 10, wherein the display device comprises a television.

12. A method as in claim 10, wherein a link control option enables the user to establish a link with a information location, the step of controlling aspects of the operation of the system further comprising the step of establishing the link with the information location in response to selection of the link control option.

13. A computer readable medium encoded with one or more computer programs for enabling engagement of the peripheral attention of a person in the vicinity of a display device, comprising:

instructions for acquiring a set of content data from a content providing system;

instructions for selectively displaying on the display device, in an unobtrusive manner that does not distract a user of the display device or an apparatus associated with the display device from a primary interaction with the display device or apparatus, an image or images generated from the set of content data;

instructions for enabling selection by a user of one or more control options during the selective display of the image or images generated from the set of content data; and

instructions for controlling aspects of the operation of the system in accordance with a selected control option;

wherein the set of content data is selected from a plurality of sets of content data, each set being provided by an

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associated content provider, wherein each associated content provider is located in a different physical location than at least one other content provider and each content provider provides its content data to a content display system associated with the and located entirely in the same physical location as the display device independently of each other content provider and without the content data being aggregated at a common physical location remote from the content display system prior to being provided to the content display system, and wherein for each set the respective content provider may provide scheduling instructions tailored to the set of content data to control at least one

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of the duration, sequencing, and timing of the display of said image or images generated from the set of content data.

14. A computer readable medium as in claim 13, wherein the one or more computer programs enable display of an image or images on a display device comprising a television.

15. A computer readable medium as in claim 13, wherein a link control option enables the user to establish a link with an information location, the instructions for controlling aspects of the operation of the system further comprising instructions for establishing the link with the information location in response to selection of the link control.

\* \* \* \* \*

United States Court of Appeals  
for the Federal Circuit

*Interval Licensing LLC v AOL, Inc.*, 2013-1282, -1283, -1284, 1285

# CERTIFICATE OF SERVICE

I, Robyn Cocho, being duly sworn according to law and being over the age of 18, upon my oath depose and say that:

Counsel Press was retained by HEIM, PAYNE & CHORUSH LLP,  
Attorneys for Appellant to print this document. I am an employee of Counsel  
Press.

On **June 27, 2013**, Counsel for Appellant has authorized me to electronically file the foregoing **BRIEF FOR APPELLANT** with the Clerk of Court using the CM/ECF System, which will serve via e-mail notice of such filing to any of the following counsel registered as CM/ECF users:

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## CERTIFICATE OF COMPLIANCE

Pursuant to Federal Rules of Appellate Procedure 28.1(e)(3) and 32(a)(7)(C), the undersigned hereby certifies that this brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 28.1(e)(2)(B)(i).

1. This brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B) and Federal Circuit Rule 32(b) because this brief contains 13,967 words, excluding the parts of the brief exempted by Federal Circuit Rule 32(b)(1)-(3).
2. This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because this brief has been prepared in a proportionally spaced typeface using Microsoft Word 2007 in 14-point Times New Roman Font.

Dated: June 27, 2013

/s/ Justin A. Nelson  
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